PACKAGE engineering

Board absorbency and high-speed sealing

Using "water drop" and "contact angle" tests of paperboard wettability and water absorption rates as practical aids to carton sealing with less compression time and space on high-speed packaging lines. (See page 27)

What's new in food packaging

A running review of research and technology (with citations) as revealed by the patents and literature of the past 18 months — emphasizing current developments and significant trends. (See page 31)

Choosing and using flexible films

Questions to ask and answers to seek in establishing package requirements, deciding on specific films, putting them to practical tests, and refining the resulting choices of films and combinations. (See page 38)

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For your calendar

December 2-4. AMA Packaging Clinic, How to Prepare Packaging Specifications, New York. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

December 16-18. AMA Packaging Clinic, Packaging Operation of Small Runs and Multiple Items, New York. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

January 6-8. AMA Packaging Conference (special packaging conference), Commodore Hotel, New York. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

January 20-23. National Canners Association Convention, Traymore Hotel, Atlantic City. Contact: Nelson H. Budd, National Canners Association, 1133 20th Street, N. W., Washington 6, D. C. *Telephone: Executive 3-7030.*

January 19-23. Canning Machinery and Supplies Association Exhibit, Convention Hall, Atlantic City. Contact: W. D. Lewis, Secretary, Canning Machinery and Supplies Association, 4630 Montgomery Avenue, Washington 14, D. C. *Telephone: Oliver 6-6979.*

January 27-29. AMA Packaging Clinic, The Economics of Packaging Machinery, New York. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

March 25-28. The Packaging Machinery & Materials Exposition of 1958, sponsored by the Packaging Machinery Manufacturers Institute. Contact: Hanson & Shea, Inc., Exposition Management, Suite 759, One Gateway Center, Pittsburgh 22, Pennsylvania. *Telephone: Atlantic 1-8552.*

The executive and editorial offices of Package Engineering are now located at 185 North Wabash Avenue, Chicago 1, Illinois. Telephone FInancial 6-1440.

AN ANGUS J. RAY PUBLICATION

Articles

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Thorough how-to-do-it explanations (with drawings) of workable tests suitable for use by package users in determining absorption.

31 **Technical developments in food packaging,** by Martin S. Peterson, chief, technical services office, publications and reports office, Quartermaster Food and Container Institute
A panoramic review (with citations) of the technical literature and patents of the past 18 months' developments in food packaging.

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64 **Cumulative annual index**
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Aluminum Foil Packaging As a Material for Printing

Report No. 12 of a Series by Reynolds Metals Company

In addition to its well known protective properties, aluminum foil offers special advantages—and problems—as a surface for printing. The outstanding characteristic is, of course, brightness—or light reflection. Aluminum foil, with a reflectivity of approximately 85% for visible light, possesses exceptional brightness.

This is particularly important in self-service retailing because of the confusing array of similar and competitive products displayed side by side. To sell itself effectively, a package must, first of all, attract attention. It must catch the eye—stand out. Brightness, by itself, can meet this first essential—and help meet the further requirements of attractive modern design and unmistakable product identification.

Developed Transparent Inks

But adding color to this brightness required the development of today's transparent inks. These transmit a large part of the light falling on them and permit reflection from the foil beneath to create rich and glowing effects. Package designers now use transparent inks extensively, often in combination with opaque inks, for sparkling contrast and maximum legibility.

Aluminum foil is completely non-absorptive—nothing can soak through from the inside, or be soaked up on the outside. And the very smoothness of foil means a clean package, as well as greater eye-appeal. Yet these advantages also posed printing problems at the beginning. It was necessary to develop inks that would take hold despite the non-absorptivity—that would permanently grip the smooth surface. This is especially important because of the scuff resistance required in retail handling.

To solve these problems, Reynolds spent years developing inks which have extremely high forces of attraction for the foil surface—and which at the same time maintain the properties of transparency or opacity, drying speed, proper viscosity, etc. Proof of success is the high durability of today's printed foil packages—with adhesion of inks comparable to printing on paper. For extraordinary scuff resistance, a series of clear overprinting lacquers has been developed. Application of one of these over a printed surface provides a combination satisfactory for even the most critical use.

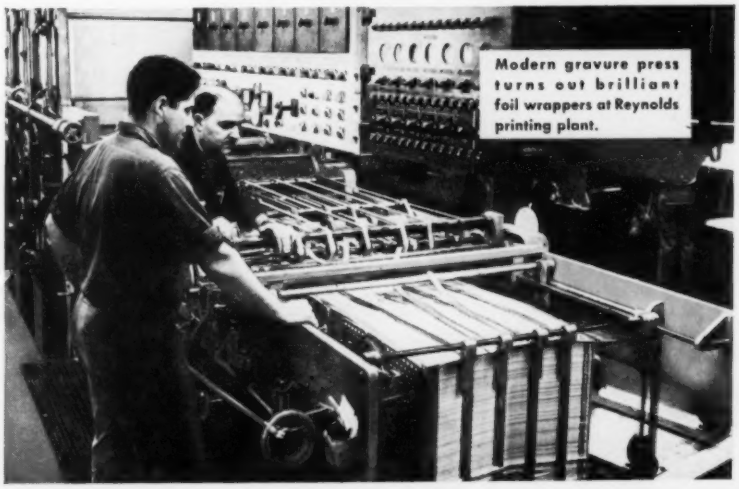
Proving Fade Resistance

Another vital property is resistance to fading from exposure to heat and ultraviolet light. Display brilliance must not be lost. There is now a wide variety of available pigments which will not fade in fadeometer tests exceeding 100 hours.

Finally, it was necessary to solve all of the problems encountered in shifting from the laboratory to the print shop. Twenty five years of practical experience have accomplished this and foil can now be printed as readily as papers or films. Crisp, clean, multicolor reproductions, with delicate tones as well as vivid colors, are achieved in simple or intricate designs—on rotogravure presses—at web speeds exceeding 500 feet per minute. Printed aluminum foil is an established commercial product—assuring high visibility, instant identification and unmatched protection in a single packaging material.

Reynolds has unexcelled facilities for servicing your foil printing requirements—from original design to final printed product. Your local Reynolds representative can place at your disposal an experienced staff of artists and package design engineers to aid you in creating a distinctive new design or in most effectively adapting your present design to foil. Or you may write to **Reynolds Metals Company,** General Sales Office, Louisville 1, Kentucky.

Watch Reynolds All-Family Television Show "DISNEYLAND", ABC-TV.



Modern gravure press turns out brilliant foil wrappers at Reynolds printing plant.

SIPMHE, The Society of Industrial Packaging and Materials Handling Engineers, is a very progressive organization in most of its activities, but its promotion of its annual exhibition leaves much to be desired. Its progressive activities include its short course in packaging, which is presented in connection with its annual exposition. This was probably the first systematic effort to provide technical information about packaging, and the caliber of its efforts has been outstanding. Its annual award for packages of various types has done much to make industry aware of profit-building possibilities of good package engineering and has done much to help bring the goal of a professional status for the packaging engineer closer to reality. Its regional meetings create one of the few opportunities packaging men have of getting together, other than in New York or Chicago, to discuss packaging with people of similar interests.

However, SIPMHE does not get the sizeable attendance at their show which they should, and I believe the reason is because they do not put enough steam behind their efforts to publicize the show. Low attendance is not entirely due to low-power promotion, of course. We believe a show of this type would do better in a metropolitan center rather than in Atlantic City; and the Packaging Institute's annual forum was held at the same time in New York, which might have hurt attendance.

We all know the number of trade shows concerned in whole or in part with packaging has mushroomed since the war, along with the growth of the packaging field itself. For instance, there will be at least four different packaging shows in the United States alone next year. People have to be more selective in the shows they attend, and even large companies do not send big delegations to all shows. The trade shows have to sell themselves beforehand on their particular merit, and far enough in advance so that they can be anticipated and worked into the busiest schedule and into a company's budget.

While the exhibitors agreed that the *quality* of the attendance and the interest shown were excellent, they also felt the attendance was somewhat less than desirable.

There were a number of worthwhile things to see; among them was a chemical used to prevent damage due to extreme temperatures. This has great possibilities in packaging something like radar equipment, for instance, where metal components might break under shock in an extremely low temperature. Such a product could minimize or eliminate such hazards. Another product I had not seen before was a cushioning material that consisted of a bat of synthetic fibres bonded to single-face corrugated. It was being used to package mercury switches and had shown substantial savings in package simplification.

These and many worthwhile products were exhibited at the SIPMHE show — but again, there were not enough people to see them. Exhibitors have a very substantial investment in time and money when exhibiting at any show, and if a show is to survive it has to provide a quality audience in sufficient quantity to make exhibiting worthwhile.

The merits of SIPMHE should be publicized far beyond the mailing lists of various exhibitors. For three or four months prior to the show it should be publicized far and wide — where it is going to be held — what's being shown — why it's a worthwhile investment in time and money to visit it.

Angus J. Ray
Publisher

PACKAGE engineering®

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BPA

For more information circle No. 204 on Card →

Most customers of the Maine Potato Bag Company insist on Dobeckmun polyethylene. H. N. Aldrich, Sales Manager, says: "None can compare with Dobeckmun. Most of all we like the printing and the quality of Dobeckmun's polyethylene bag."

Packages for performance...

Dobeckmun polyethylene wraps up a performance every time. This versatile, practical packaging film sells to the eye . . . promotes . . . protects. For teddy-bears and tablecloths, bonbons, bedspreads and poultry, too, its high gloss presents your product at its best, adds lustre to your brand name and selling message. Dobeckmun polyethylene is rigidly controlled from the basic resin to the finished bag to create the ultimate in transparency. Dobeckmun printing on polyethylene is unmatched. From the first idea to the actual printed polyethylene package, your product, with all its potentials—is packaged for performance by

The Dobeckmun Company, A Division of The Dow Chemical Company

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Shampoos belong in PLAX bottles

Some things are made for each other. A good shampoo and a Plax squeeze-bottle, for example. The bottle feels light and easy in your hands, you can grip it firmly, set it down anywhere (no harm if it drops). It's equally at home in the shower or at the wash basin; puts the shampoo right on your scalp where you want it.

If you have children, you know what it means to have soft and unbreakable containers for every-day products. And when you travel, Plax bottles are ideal.

Many smart manufacturers offer you shampoos (and many other products) in Plax bottles. Look for their products.

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and these shampoos are...

Letters to PACKAGE engineering

Gentlemen:

Congratulations upon the selection of Package Engineering for inclusion in the Engineering Index. Your magazine has made a fine reputation in less than two years.

You are publishing technical articles with such sound value that alert packaging engineers want to save them for their data files, which poses a layout problem for you. This you have solved quite well except that sometimes the pages near the back get fouled when viewed from the point of view of the collector who wants to save two adjacent articles. For example, Dr. Peterson's article on "Using Technical Information" in the October issue is continued on pages 67 and 69, while Mr. Long's article on "Flexible Packages" is continued on page 68. With just one copy of the magazine, how can we unscramble these two articles?

Charles J. Zusi
Packaging Consultant
Skokie, Illinois

Under separate cover we have sent you copies of the articles you mention. We are keenly aware of the desire of many readers to file specific articles. We appreciate that many readers like to keep their magazines intact and at the same time, file individual articles. Therefore, we have repeatedly offered our readers tear-sheet copies of articles and we frequently can meet requests by furnishing actual reprints. We appreciate your problem and would like to present our articles in such form that the reader desiring to file individual articles is not handicapped. In the meantime, we hope that our offer of specific individual copies meets your need as well as that of other readers similarly situated.

Do you really love me for Myself ?

Cocktails, candlelight and courtship are one thing. The breakfast table, hair up in curlers and marriage can be quite another. As different for instance as buying packaging boards in a competitive and a seller's market.

We produce bleached boards and sell them under a plan unique in our industry. We actually reserve machine time for each regular customer. The board produced (to customer specification) in that time belongs to him in all kinds of markets.

With integration of mill and converter very much in vogue, Crossett, as an independent mill, is without ties of any kind except those of loyalty to regular customers.

May we tell you more about it and present samples of our boards?

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300 West Washington

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a Division of The Crossett Company

Crossett, Arkansas

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MR. PACKAGING ENGINEER:

ARE YOU REALLY SURE OF THE QUALITY OF YOUR PACKAGING MATERIALS?

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UNIT PACKAGER
WITH
CONVEYOR FEED

This manually fed conveyor is the ideal feeding system for packaging small textile products, flat food items, toys, bandages, or any other reasonably flat small product.

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Wrap-Ade Unit Packagers perform an entire cycle of packaging operations including feeding, filling, forming and sealing practically every type of heat sealing materials. Photo Electric registration available.

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Celebrating a Quarter Century of Progress in Packaging
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PHONE—PLYMOUTH 9-6150

Gentlemen:

We are interested in your assistance in helping us locate a company that can supply us with a unit that will do the following:

This unit is for the purpose of wrapping thread around a round rod (Fishing Rod). This is seen on fishing rods, golf club heads etc. The thread that is used to wrap around is somewhat similar to nylon sewing thread size B, C or D. The rods for which this is wrapped are sturdy ranging from ¼" to ¾" in diameter.

The quantity of these wraps should be approximately 1,000 or 2,000 per hour.

We are doing this same operation for approximately 50 years and there is not much change throughout the years which is rather slow.

On the attached sheet you will see a sample diagram showing the present principle used to start and stop a thread wrapped around a rod. However, any method can be used as long as the thread stays wrapped around the rod and is not confined to this particular method.

F.J.G.

Although such a wrapping problem is slightly afield from the major areas of technical and operational packaging which our readers and suppliers focus upon, this inquiry presents a wrapping problem that might lend itself to solution by packaging experts. We have the diagram prepared by Reader F.J.G. and will forward it to anyone writing us at Package Engineering, 185 N. Wabash Avenue, Chicago 1, Illinois. We have found that many such complex problems really become quite simple once the right equipment has been located. Frequently the major difficulty is getting the user in touch with the supplier best able to help him. Incidentally, we welcome queries from readers regarding equipment and problems involving equipment. But when you do write us, please make your queries as specific as possible and include any helpful illustrative material such as diagrams. We welcome our opportunity of being of service and bringing user and supplier together.

Vulcan delivers steel pails *faster,* SAVES YOU SPACE AND MONEY!

This is a true case history of all the companies who use Vulcan steel shipping containers. Their composite story reads like this: delivery of pails forced them to tie-up excessive funds and space in a big inventory. They switched to Vulcan, and got faster delivery, in all quantities, on a precise and rigidly maintained schedule. Their inventory needs dwindled rapidly, and they had more free cash and manufacturing space. The same thing can happen to you, because Vulcan is an expert authority engaged exclusively in the manufacture of steel pails and drums, and maintains the largest warehouse stock of these items. This means we can deliver your needs and inventory savings at the same time. May we prove it to you?

NOW! REDUCE STEEL CONTAINER INVENTORY COSTS! MAIL THE COUPON TODAY FOR TEST SAMPLES AND THE NAME OF YOUR VULCAN REPRESENTATIVE!

Hi-Bake protective linings · one to 55 gallon capacities all variations of open or closed heads faster delivery from the largest warehouse stock · from a carton to a carload · brand name decoration · special designs

VULCAN
CONTAINERS INC.
Bellwood, Illinois

VULCAN CONTAINERS INC., Bellwood, Illinois

Gentlemen: I am interested in:

- ☐ Pails, in the following sizes.....
- ☐ Hi-Bake protective linings for (product).....
- ☐ 55 gallon drums.

Please get this information to—

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Company.....

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City..... Zone.... State.....

Dow Corning

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Anyone packaging sticky products in paper or paperboard containers can now offer their customers easier "release" with a Dow Corning SILICONE COATING. This new paper coating provides a surface to which almost nothing will stick. The gummiest of materials . . . asphalt, raw rubber, candy, glue, gums, virtually any adhesive mass . . . can be easily emptied from silicone coated packages.

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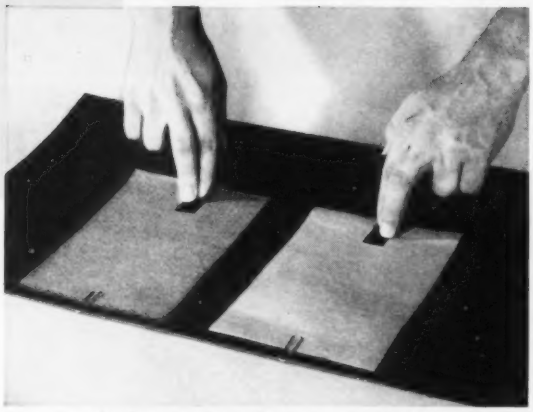
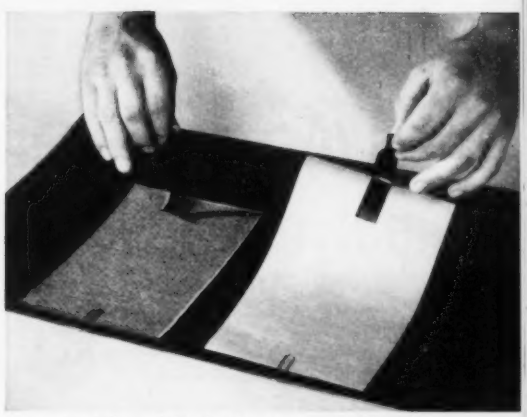
SILICONE COATING is easily applied at the mill or by the converter to any packaging stock—from glassine to boxboard. Bags, boxes, cartons, wrappers, interleaving sheets . . . all can be supplied with the new Dow Corning anti-adhesive SILICONE COATING.



1. **Both samples shown are of the same paper. Piece at left has the new SILICONE COATING. Other sample is untreated. Pressure-sensitive tape is pressed firmly on each.**



2. **When lifted, the tape applied to silicone coated paper flicks free without clinging. Tape applied to untreated paper sticks tight. Make your own test.**

R ALL STICKY PRODUCTS

Silicones Don't Contaminate — Industrial products, such as rubber and asphalt, are not contaminated in the least by the new SILICONE COATING. Nor are consumer goods, such as candy and sweet rolls, affected by the "food grade" coating specified for food packaging or wrapping.

No Undesirable Effect on Paper . . . Dow Corning's new SILICONE COATING is colorless, odorless, and in no way alters the body or physical strength of paper or paperboard.

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Free Samples ***For full information, samples of silicone coated papers, and a list of suppliers, WRITE DEPT. 5224a.***

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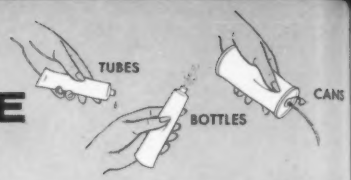
NO. 3 OF A SERIES

Bracon | SQUEEZE-TO-USE PACKAGING



How to prepare artwork for Bracon polyethylene tubes . . . bottles . . . cans

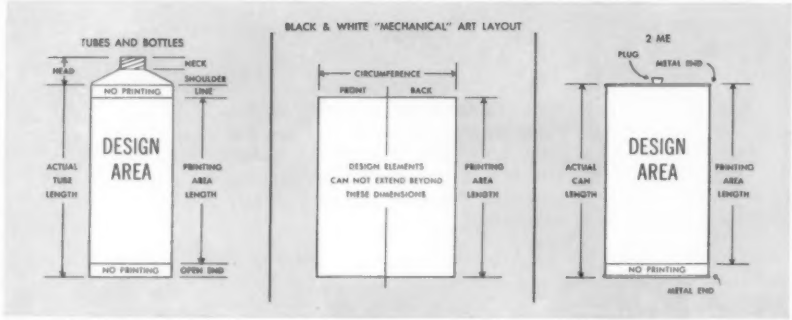
There are many questions which arise when manufacturers decide to print polyethylene containers.

Let's say your management has decided to provide its product with the many advantages of squeeze-to-use packaging. *First*, your production people would work with Bradley technicians to *evaluate the product for polyethylene packaging. Next*, you'd consider *filling and sealing* problems. *Now* let's look at possible approaches which *will provide attractive designs for the container's exterior.* BRACON technicians have established procedures for handling your artwork and adapting it to polyethylene printing requirements. Five alternative methods are described below:

1. Send rough tissue layouts of your proposed design. BRACON will prepare design mock ups for your approval. Upon approval of mock ups, BRACON will prepare the black and white artwork — sending photo prints and color samples to you for final okay before ordering plates.
2. Have your designer get in touch with BRACON. BRACON will cooperate in furnishing information, design assistance, samples, printing specs, or assist in development of designs in coordination with your designers.
3. Send rough tissue layouts to BRACON. BRACON will check your design for compatability with the BRACON process and send back the layout with their recommendations for customer preparation of finished art.
4. Send labels, art, previous containers or packages. BRACON will prepare original designs, sending back suggestions either in rough layout or mock up form for approval. BRACON will prepare final artwork after receiving approval of designs and will send photo prints and color samples before ordering plates.
5. Send information, ideas or thoughts, etc. to BRACON. BRACON will prepare original art, merchandising ideas, and layouts in mock up form. Your Art Department or outside design source can develop the finished black and white art following BRACON layouts and BRACON specification sheets.

Whatever alternative is used, you have the option of receiving artwork from BRACON in any of these forms:

1. Rough layouts in mock up form
2. Rough layouts in two dimensions
3. Comprehensive layouts in mock up form
4. Positive acetate prints of final artwork in mock up form
5. Print samples



Printing Surface: The area which is available for printing on a container must be carefully defined to the art group who will be responsible for final drawings. Of course, it is important to the designer, also, to know the limitations of ink coverage imposed by manufacturing methods. The drawings above show how the "printing area" is determined for both tubes and bottles, as well as squeeze-cans.

Certain precautions should be observed before submitting final artwork for BRACON processing. The following rules will provide a general rule-of-thumb for evaluating your printing.

Proceed with caution . . . check with Bradley *first* if you want to:

- Use duo-tone or full process screen.
- Employ large solid print areas covering more than one-half of tube surface.
- Design large reverse in the same color as small type. (Heavy ink coverage necessary for reverse areas will cause small type to fill in and blot.)
- Use fine detail or strippling, dry brush, etc.

There's no problem if you:

- Keep detail open and reasonably coarse when illustrating in pebble and scratch board.
- Observe caution in designing 85 to 100 line halftone and Benday reproductions. Halftones cannot be run on plastic heavier than 85% of color density, and the process requires special handling which is not possible in all cases.
- Provide 1/32" minimum clearance for cross hatched panels or decorative borders.

Hints on Registration

- Avoid overprinting of colors.
- Provide panel for small type when complete circumferential reverse area is used.
- Restrict two-color registration to one side, and if possible, provide 1/32" min. clearance between colors.
- Use caution in designing circumferential bands.

Type Tips

- San serif styles reproduce best for body and small point size copy.
- News Gothic Condensed and Futura Medium Condensed have proven most successful for extensive body copy, and can be reproduced as low as 3 point.
- For reverse copy, Heavy San Serifs are best.
- Bodoni — Caslon and Century Regular reproduce poorly.
- If traditional type style is desired, Century Schoolbook has been found to reproduce well.
- Smallest positive type size — 4 pt.
- Smallest negative type size — 6 pt.

BRADLEY CONTAINER CORPORATION

A subsidiary of American Can Company

MAYNARD, MASSACHUSETTS

New York • Chicago • Los Angeles • Toronto

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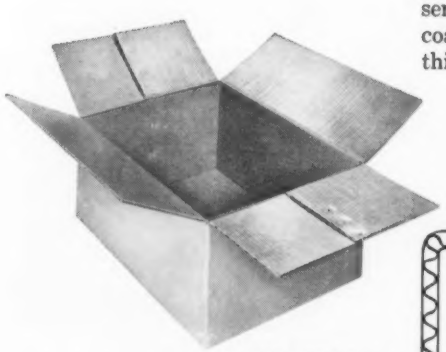
←For

Now! Protection without liners!

The secret—A-C Polyethylene: Articles arrive in "factory-fresh" condition without sales destroying surface scratches or blemishes.

What A-C Polyethylene does: The A-C POLYETHYLENE-wax blend coat holds scratchy paper fibers down. Carton producers apply A-C POLYETHYLENE blends as easily as wax but it gives a far glossier, much stronger coating than wax alone. There are savings all down the packaging line—in material costs, handling, and storage.

Ask about A-C coating from your supplier: He can furnish your cartons and spacers with A-C POLYETHYLENE blend coatings . . . eliminating your need for liners, reducing your costs, and giving your merchandise sure protection. If you wish, we can send you more information on the new A-C POLYETHYLENE-coated cartons or the name of your nearest converter supplying this new type premium shipping container in your area.



Coated Snap-Stitch Carton
Courtesy Victory Container Corp.

For more information, mail this coupon now . . .

A-C® Polyethylene

SEMET-SOLVAY PETROCHEMICAL DIVISION
Allied Chemical & Dye Corporation
Dept 523-V, 40 Rector Street
New York 6, New York

Allied Chemical

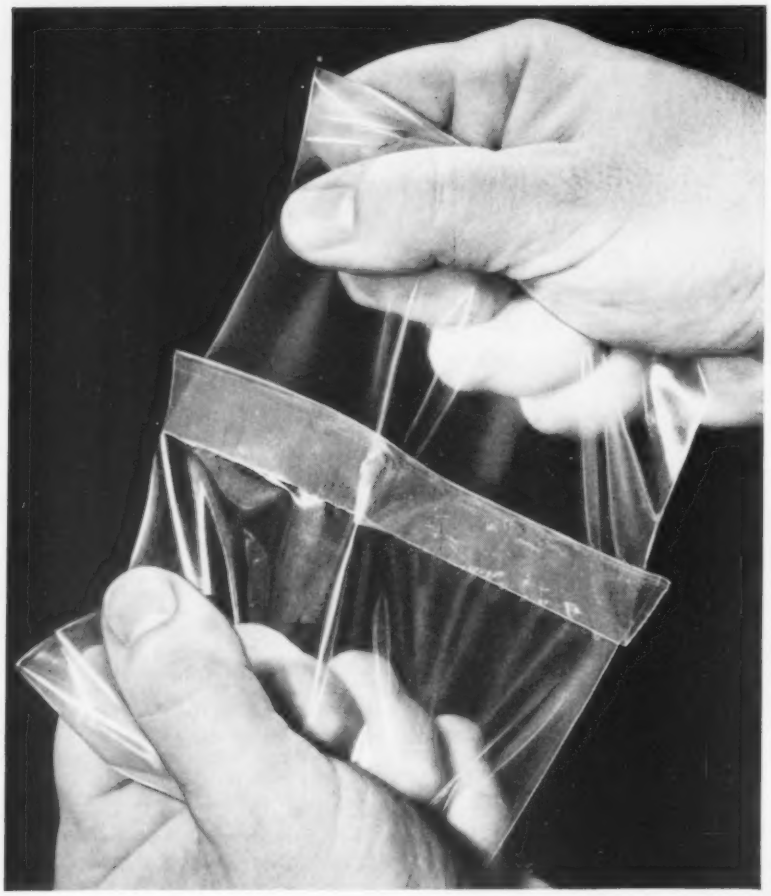
Tell me more about new coated corrugated cartons.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____



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NOW...POLYESTER FILM YOU CAN HEAT SEAL!

Impossible? Not any more! "Scotchpak" Brand Polyester Film takes a seal as tough as the film itself—and easily: a temperature of 275° to 359°F. and 20-60 psi is all that's required.

"Scotchpak" is the perfect packaging material for critical applications where inertness of the wrapper and protection of the contents under extreme temperature conditions is vital. It resists most solvents and chemicals, has high moisture inertness and high tensile strength.

You can use "Scotchpak" for packaging such varied products as cosmetics, acids, syrups, silverware, oils, greases, adhesives, asphaltics, catsup and mustard, surgical dressings—and many others. It even makes an ideal container liner or insulation pillow.

For more information, send for the folder described at right.

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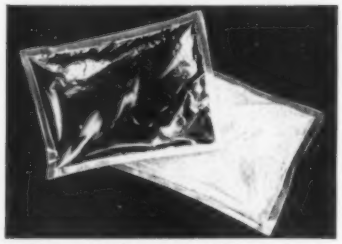
"SCOTCHPAK"

BRAND

HEAT-SEALABLE POLYESTER FILM

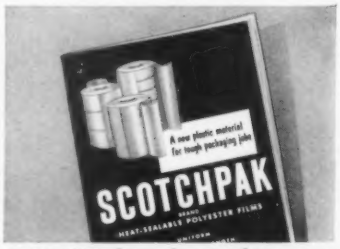
Look what you can do with it!



ACIDS or volatile chemicals can be packaged easily, handled safely, shipped without fear in heat-sealable containers of new "Scotchpak" Polyester Film. Also lines drums and cartons.

FOOD ITEMS are packaged safely in clear-as-glass "Scotchpak" Film. Contents can be frozen . . . even boiled *right in the package*. Low gas penetration rate . . . inert and non-toxic.

METAL PARTS can be packaged dry or in oil or grease to protect them against corrosion. Transparent packages are easy to handle, easy to ship and to store. Simplifies issuing of parts and units.



FREE FOLDER shows dozens of ways you can solve your most difficult packaging and shipping problems with new "Scotchpak" Polyester Film. Just write on your letterhead: Film Products Group, 3M Co., St. Paul 6, Minn., Dept. LY-127.

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PRODUCT OF 3M COMPANY RESEARCH

Label inventories
lowered—with the Tickometer

Label shortages can stop a production line or slow deliveries, so you play safe and order enough. Labels fill up stockrooms, steal storage space. Changes in package content or product specifications make labels obsolete . . . Hundreds of companies have found imprinting with the Tickometer lowers label inventories, prevents waste and reduces label costs.

- Keep on hand only basic label forms and sizes. With the Tickometer you can imprint designations as needed . . . type, grade, weight, size, color, date, code, etc. Labels can be prepared for daily production, batch limits or special assortments—with consequent saving of inventory, printing costs, and wasted labels.
- The Tickometer prints up to 1000 pieces per *minute*, can produce a lot of labels in a hurry. Printing surface up to 2 3/16 by 1/8 inches, with close register on most weights and finishes of paper or light card stock. Takes sizes as small as 1 by 2 inches, up to 15 by 15 inches, according to the model. It feeds and stacks automatically, and *counts so accurately banks use it to count currency!* Makes a predetermined count, records part or full totals, with optional consecutive numbering.
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Call the nearest PB office for demonstration. Or send coupon for free illustrated booklet, and user case studies.

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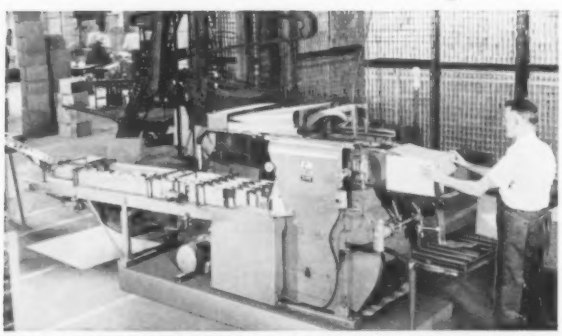
DOES YOUR PACK SUFFER *Bowling Ball Impact?*

Time to replace with a New Improved FMC NON-SHOCK CASER —so *Smooth and Gentle* to Cans and Contents



FMC's NON-SHOCK CASER "babies" cans into cases at a fast clip, limited only by the speed of the operator.

—even at speeds up to 1200 cases per hour!

Old methods of casing no longer meet the requirements of spoilage-free, high-speed operations—especially where loosening can seams of high-vacuum packs is a problem. The new Model 3 FMC Non-Shock Caser, with all its exclusive features for big capacity and gentle handling, really "delivers the goods" to the case completely free of damaging impact to cans, labels or product. Compact and flexible, machines are built to handle specific can sizes and certain combinations from 202 x 308 packed 6 x 8, to 603 x 700 packed 2 x 3.

Remember: There are extra dividends when you care for your cans all the way to the case – with an FMC *Non-Shock* Caser!

NO ROLLING – NO NEAR SEAM IMPACT
Cans enter the machine *upright*, move smoothly along woven wire belt, are transferred gently to the case.

NO CAN ELEVATOR REQUIRED
Cans are delivered to the continuous feed belt through a 90° twister, avoiding the seam-splitting action of steep gravity-roll contact.

FREE BULLETIN AVAILABLE
Fully illustrated Non-Shock Caser bulletin is yours for the asking. Better yet, call your FMC representative today for complete information!

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Canning Machinery Division

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The outward sign of inward value

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Large scale convenience comes in a small package... when "do-it-yourself" aids are packaged in handy collapsible metal tubes by Wirz. What better way to keep product *in*, air out? Wirz tubes with built-in applicator tips stimulate new buying—*and* selling—habits. Discuss your packaging program with Wirz tube specialists.

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RIGID CANS AND IMPACT EXTRUSIONS BY AMERICAN EXTRUSION CORPORATION, DIVISION OF A. H. WIRZ, INC.

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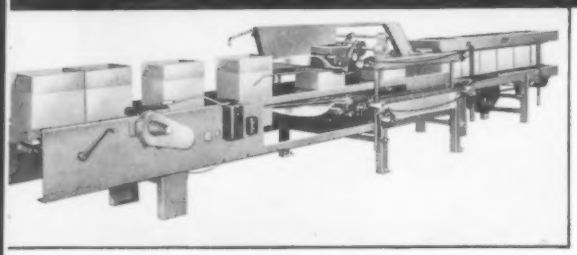
Out-of-date with your case sealing methods?



Packomatic

T.M. Reg. U. S. Pat. Off.

equipment feeds, forms, positions, loads, seals, and imprints shipping containers automatically

Fully-automatic Packomatic Custom-Engineered machines go all the way—or any part of the way—with your packaging operations. Modernize your present line with a fully-automatic case sealer—or really put it into high gear with a Packomatic that feeds, forms, and positions shipping containers, end-loads them with cans or cartons at top speed, then discharges them sealed and imprinted, ready for shipment. Most important, only one part-time operator is needed for the whole operation. Labor costs are obviously reduced. End-loading techniques shrink paper board costs up to 28% and your whole output takes a sharp climb. Packomatics can save time and money. Let us show you.

PACKOMATIC FULLY-AUTOMATIC CASE SEALER

Loaded shipping containers IN, sealed cases OUT—and no operator needed! It aligns corrugated cases, positions flaps, glues, seals and discharges fully-automatically. Packomatic was first with this production-proved machine. It's available in a wide range of case sizes for installation on your present line. Semi-automatic, too.

J. L. FERGUSON CO. Joliet 1, Ill.

New York, Chicago, Cleveland, Boston, Tampa, Baltimore, Portland, Denver, Los Angeles, San Francisco, Seattle, New Orleans, Louisville, Kansas City and All Principal Canadian Cities.

PACKOMATIC machines include the Bale Sealer — Case Sealers — Opener-Loaders — Case Imprinters — Telescoping Volumetric Filler — Packer-Gluers. Units available, semi-automatic or fully-automatic depending on your needs.

Six 5-qt. cans or gallon cans in 20⅞" x 13⅝" x 9 1⅜16" case

Twelve 46 oz. cans in 21" x 13" x 7⅛" case

Twenty-four cartons in 12½" x 10⅛" x 8½" case

Eighteen 7 & 8 oz. cartons in 20" x 14⅞" x 8⅝" case

Sixty cigarette cartons
King Size: 17⅞" x 11½" x 22"
Regular: 14 13/16" x 11½" x 22"

TYPICAL CASE LOADING PATTERNS FOR CANS AND CARTONS

Twenty-four 12 oz. cans in 16⅜" x 10 15/16" x 5 3/16" case

Six No. 10 cans in 22 1/16" x 17⅜" x 7⅛" case

Thirty 1 lb. cartons in 16⅛" x 10 5/16" x 7¼" case

Twenty-four cartons in 19½" x 10⅞" x 7" case

Forty-eight cartons in 22¾" x 23½" x 15⅜" case

For more

When you can refreshment...

make it light on the inside . . .
bright on the outside

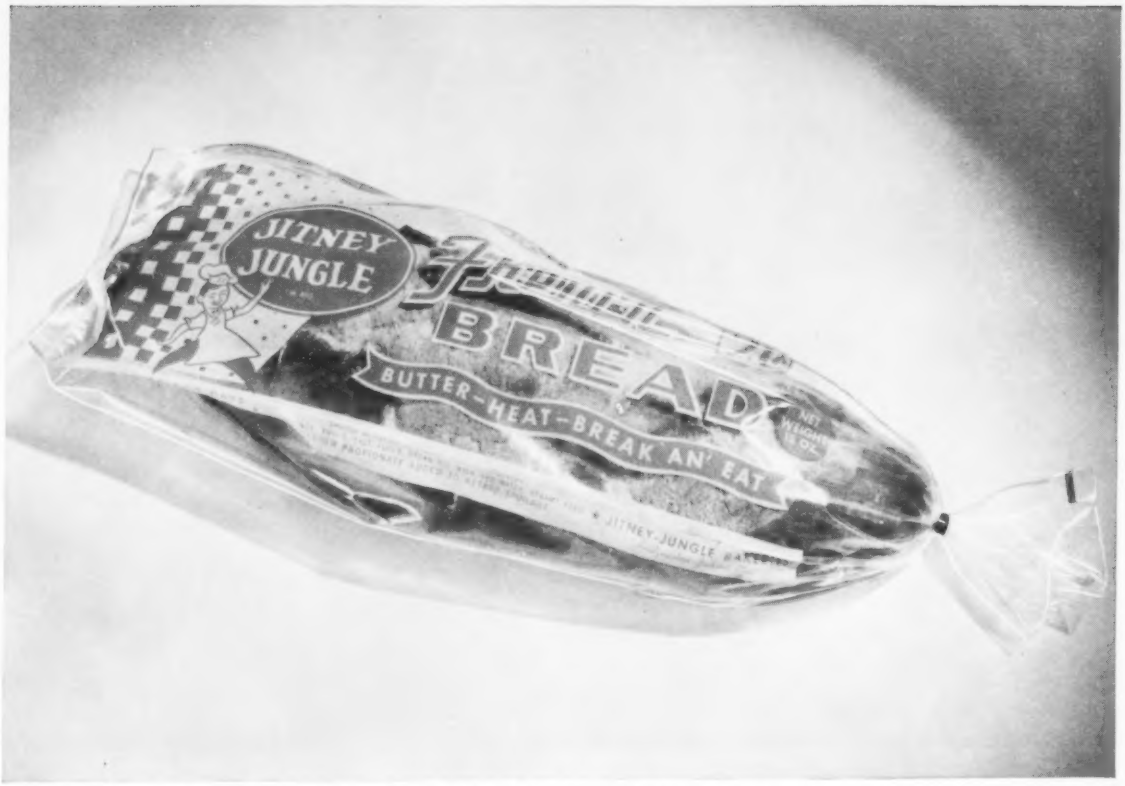
and you *can* with CROWN—quality containers to suit your exact requirements . . . when and where you want them, to suit *your* production schedules.

Complete package design and merchandising service . . . modern lithography equipment and techniques . . . experienced research and engineering service . . . all come with that *extra* touch of CROWN personal attention. Plants and offices in 18 strategic locations.

Write for your copy of CROWN's new booklet, "Crown Art and Lithography". Crown Cork & Seal Company, Inc., Can Division, 9396 Ashton Road, Philadelphia 36, Pa.

whatever you can . . . call on CROWN

CROWN CORK & SEAL COMPANY, INC.
MANUFACTURERS OF CLOSURES, CONTAINERS and MACHINERY



The polyethylene film bag retains moisture enabling it to keep baked goods fresher . . . longer.

Packaging in low-cost polyethylene bags

"More than doubled our sales"

"We are most pleased with the polyethylene bag and the way it keeps our product," states W. B. McCarty, Jr., of Jitney-Jungle Stores, Inc., Jackson, Miss. "I can truthfully say that our sales have more than doubled."

Case histories show that film bags made from BAKELITE Brand Polyethylene build sales for all kinds of bakery products. Shoppers prefer them. They can see the contents are kept clean and fresh. And, they reuse polyethylene bags at home. This builds brand loyalty for repeat sales.

Why don't you use polyethylene bags? Build extra sales with the type of packaging that protects and promotes your product in the store and advertises in the home. The low cost will surprise you. Ask your supplier or write Dept. AE-157.

IT PAYS TO PACKAGE IN FILM MADE OF

BAKELITE
BRAND
POLYETHYLENE

UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation,* 30 East 42nd Street, New York 17, N. Y.

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For more information circle No. 219 on Reader Service Card ↑

For more information circle No. 220 on Card →

"We're solving our packaging problems with self-sealing Presseal cartons..."

Says Larry Robinson, president of Lawrence Robinson and Sons, seed specialists. "Time saving, labor saving Presseal is a major factor in our streamlined packaging program."

You, too, can solve packaging problems with

PRESSEAL

. . . the modern, easy-to-use carton which completely eliminates taping, gluing, stapling and other sealing methods. Factory-treated PRESSEAL carton flaps adhere together with the pat of a hand, but these same flaps will not stick to other surfaces.

If you're packing in corrugated cartons, you'll be packing better with PRESSEAL!

For Information on

PRESSEAL®

Write to

GROWERS CONTAINER CORPORATION

PLANTS IN SALINAS AND FULLERTON, CALIFORNIA AND JACKSONVILLE, FLORIDA

HEADQUARTERS in SALINAS, CALIFORNIA
SALES OFFICES — CALIFORNIA: Salinas, Fullerton, San Francisco, San Jose, Santa Rosa, El Centro, Fresno • FLORIDA: Jacksonville, Tampa, Miami Springs, Orlando • ARIZONA: Phoenix • LOUISIANA: New Orleans • GEORGIA: Atlanta ILLINOIS: Chicago • ALABAMA: Birmingham • SOUTH CAROLINA: Greenville

The Ludlow Line Protects Your Products Better

How to wrap a freight car faster for less money . . .

There are lots of ways to "wrap" a freight car. You can do it with non-expendable fabrics . . . (But they cost too much and get lost too easily). You can do it with wood . . . (Costs too much and takes too long). And you can do it the best way — with Champ waterproofed and glass-reinforced papers. Champ's low cost and high durability — (thanks to tension-tied glass reinforcement) — make it ideal for all kinds of freight packaging, unitized loading and car lining.

Champ papers are typical of Ludlow's job-tailored packaging products. Look to Ludlow for greater protection, lower costs and faster packaging. We'll consider it a privilege to serve you!

LUDLOW

PAPERS, INC.

NEEDHAM HEIGHTS 94, MASS.

Consolidating: Angier Corporation
McLaurin-Jones Company • Stocker Manufacturing Co.

Circle No. 221 on Card

The Ludlow Line: VPI-COATED PAPERS • GREASEPROOF PAPERS • WATERPROOF PAPERS • POLY-COATED PAPERS • GUMMED TAPES • FEDERAL SPECIFICATION PAPERS

announcing THE NEW

DIAMOND GARDNER CORPORATION

a merger of THE DIAMOND MATCH COMPANY *and* THE GARDNER BOARD AND CARTON CO.

This merger, completed on October 31, 1957, comes as a natural step in the diversification of both companies, with distinct advantages to each. Long known as a leading manufacturer of matches, Diamond's production, today, includes lumber and lumber products, many woodenware items, and a wide range of molded pulp and paperboard products now accounting for the largest percentage of its operations. The company has an unbroken record of quarterly dividend payments since its organization 76 years ago . . . has forest reserves of over 376,000 acres . . . and reported sales in 1956 of $134 million.

The 57-year-old Gardner Company is a producer of paperboard and cartons for more than 1600 important manufacturers and wholesale and retail merchants. Sales in 1956 were $36 million. For many years much of the paperboard used to make and package Diamond matches has been supplied by Gardner. Both companies depend on the same source of raw material—the forests. The products of both companies, although entirely different, complement each other: Diamond in molded pulp; Gardner in paperboard.

Gardner's research has been responsible for many pioneering developments; Diamond's research has made steady progress toward full commercial utilization of wood fibers. The new corporation's able management, specialized technicians and sales personnel will contribute materially to its growth.

important facts *about the new* DIAMOND GARDNER CORPORATION

Combined 1956 sales $170 million.

Combined total assets $141 million.

Combined working capital $52 million.

A diversified business—approximately 47% of combined production in molded pulp and paperboard, 23% in retail yards and stores, 17% in matches and woodenware, 13% in lumber production and mill sales.

11,000 employees in 27 manufacturing plants, 10 sawmills, 88 retail stores and lumber yards.

A current $32 million expansion and modernization program.

A dynamic growth potential in diversified forest products.

SOME DIAMOND GARDNER PRODUCTS:

"Foodtainers"®—molded pulp containers for prepackaging meat and produce for America's 27,000 self-service markets.

Custom cartons—multi-colored packages for over 1600 customers in soap, tobacco, food, beverage, pharmaceutical and other industries.

Egg cartons—molded pulp and paperboard retail containers for egg packers, large and small.

Retail folding boxes.

Corrugated shipping containers.

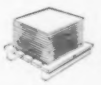
Disposable paper plates, pie plates and cake circles.

Matches—all types of paper and wooden matches.

Lumber—wholesale and retail.

"Neet-Heet"®—self-starting charcoal briquet packages.

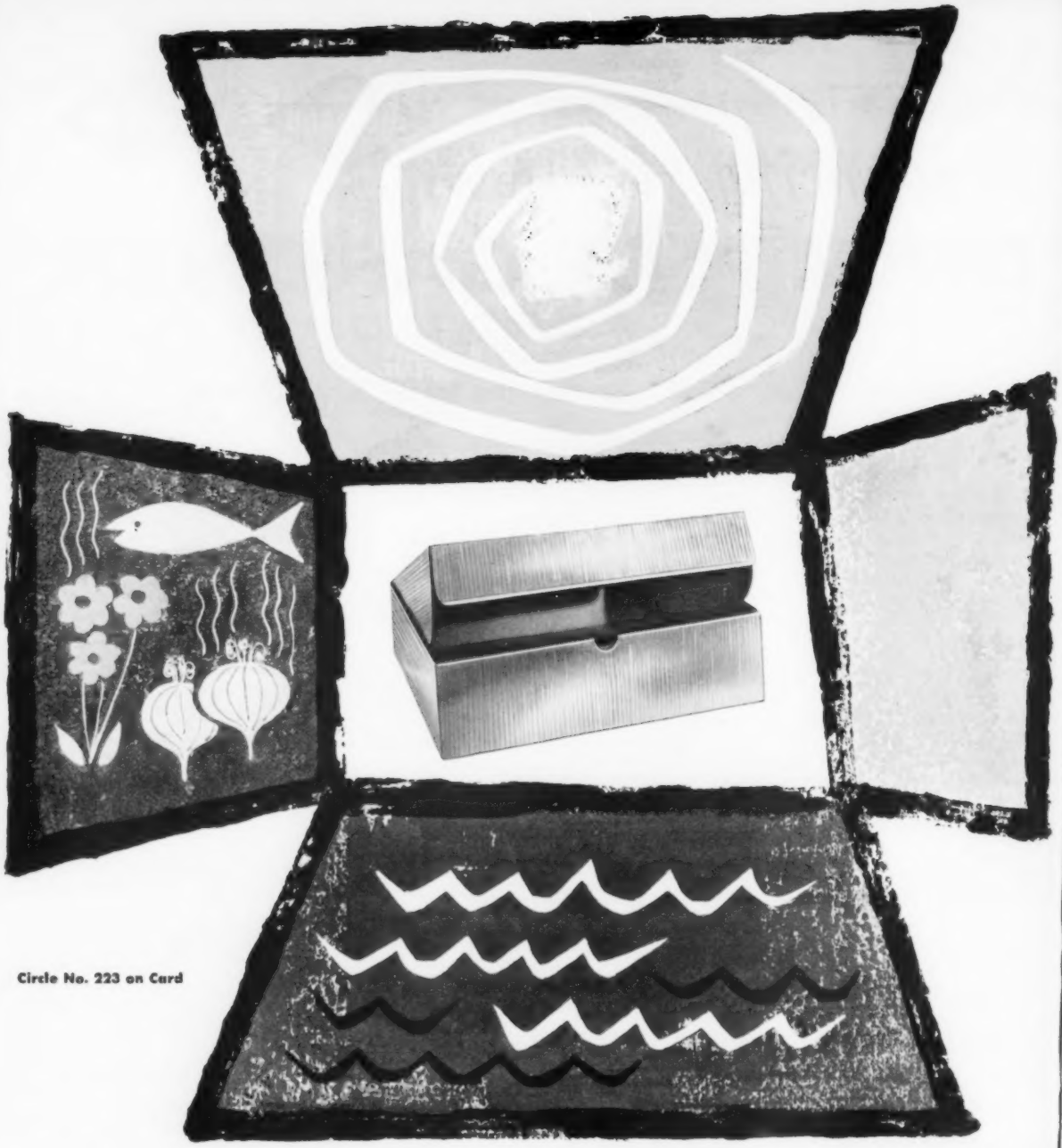
Woodenware—toothpicks, clothespins, ice cream confection sticks, etc.



Paperboard—53% of 150,000 tons annual capacity is used for cartons and folding boxes, the remainder sold as paperboard.

Containers for milk and dairy products, produced by an affiliate.

DIAMOND GARDNER CORPORATION • 122 East 42nd Street, New York 17, N. Y.



Circle No. 223 on Card

Alcoa Foil in new corrugated boxes solves temperature and moisture control problems

These new boxes give up to 100% better refrigeration efficiency for shipping and storing all kinds of perishable foods and food products . . . reduce shipping weight, provide more shipping space by eliminating need for packing with ice.

With Alcoa Foil laminated on the outside, no moisture can get in. If your product must retain its moisture, foil lamination on the inside prevents seepage that would soak or weaken corrugated containers.

Contact Your Nearest Box Manufacturer—Alcoa doesn't make foil-laminated corrugated boxes, but will supply your present manufacturer, as well as work directly with him. To get further information, write for our booklet, "New Alcoa Foil in Corrugated Boxes." Simply fill in and mail the attached coupon.

ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

NEW! "ALCOA THEATRE"
Exciting Adventure
Alternate Monday Evenings

Aluminum Company of America
1651M Alcoa Building, Pittsburgh 19, Pa.

Please send me the name and address of the manufacturer of Alcoa Foil corrugated boxes who is located nearest to me, and also your booklet, "New Alcoa Foil in Corrugated Boxes."

Name _____

Street _____

City _____

State _____

Packaging is more than "Skin Deep"!

PACKAGING PROBLEM:

Among the many products of Carnation Company, Los Angeles, is Instant Non-fat Dry Milk. The firm had been packaging this product in polyethylene-lined drums at a cost of about $4.50 per 100 pounds of instant milk. What Carnation desired was a more economical method of packaging their instant milk for the institutional market that would also permit close portion control and offer additional conveniences to the user.

Increased Sales . . . by Design!

SOLUTION:

Western-Waxide's Product Development Department, working closely with its Packaging Research and Development Laboratory and food technologists, arrived at this solution: a bag measuring 7" x 4" x 19½" was determined to be the best size for institutional portion control. It holds five pounds of dried milk—enough to make five gallons. The bag had to be sturdy and tests showed that kraft paper, laminated to .00035" foil with polyethylene coating over the foil combined the necessary strength with excellent water vapor barrier characteristics. The back seam and the double fold bottom are heat sealed—exceptionally strong as well as dust- and water vapor-proof. The combination is also a barrier to insects and vermin. Gusset sides permit easy filling, the top is heat sealed, and the bags are packed eight to the carton (40 pounds) providing a very economical packaging operation. A saving of up to 42% per 100 pounds of dried milk has been realized over the old drum-and-liner method.

●

Western-Waxide package research and development turns problems *into* profits *for* you! *These services of our packaging research and development laboratories and personnel are available to solve your packaging problems. Write or phone your nearest Western-Waxide office today.*

CROWN ZELLERBACH WESTERN-WAXIDE DIVISION

Headquarters Office: 2101 Williams St., San Leandro, Calif. • Plants and Sales Offices in Principal Cities of the United States

Manufacturers or converters of plain and printed waxed paper; foil; foil laminates; polyethylene coated paper and polyfilm laminates; films; bags; pouches and other specialized flexible packaging materials.

"...and every fourth box is free!"

This H&D corrugated box
costs only three-quarters as much
as the wooden case it replaced;
provides easier handling, improved
identification for heavy hardware.
Is cost a problem?
Better see H&D.

HINDE & DAUCH

Subsidiary of West Virginia Pulp and Paper Company

AUTHORITY ON PACKAGING • SANDUSKY, OHIO
14 FACTORIES • 42 SALES OFFICES

I. G. Nichol studied engineering and aviation at Quincy College and Parks Air College. Subsequent to his service with the Royal Canadian Air Force and the United States Air Force, he became associated with A-B-C Packaging Machine Corp. His work included installation, trouble-shooting, and technical service. Since joining Paisley Products, Inc. in 1950, he has concentrated on technical service and packaging problems involving adhesion on many types of packaging machinery and materials. His participation in the work of Packaging Institute includes the chairmanship of the Adhesion committee and membership in the Forum committee and the Adhesion to Glass-Adhesion to Board committee. He previously served as chairman of the Adhesion to Board committee.

Practical Tests of Paperboard Water Absorbency

By I. G. NICHOL, Paisley Products, Inc., Division of Morningstar, Nicol, Inc., New York

HIGH SPEED CARTONING *depends heavily on getting a successful sealing of the cartons. This directs attention to the problems of wettability and absorption of the carton stock. In his article, Mr. Nichol reviews some pertinent, workable tests and discusses related factors affecting carton adhesion.*

Manufacturers of products being packaged on speeded-up or automatic lines sometimes run into sealing problems when they use the same board and adhesive that worked successfully on older, slower systems. This difficulty may occur even though the mechanical aspects of the line are operating perfectly.

Factors contributing to such a problem consist of: (1) Wettability and water-absorption rate of the paperboard, (2) type of adhesive, and (3) the shorter compression time of speeded-up equipment. The shortened compression time makes it necessary to use a board with a fast enough rate of absorption or an adhesive designed to compensate for a relatively slow absorption rate.

Because the rates of water absorption and wettability are such important factors influencing the speed of adhesion, strength of bond, and other properties affecting sealing operations especially in lines that have been speeded-up, a thorough understanding of this subject will be advantageous to the packager. He will then be able to analyze the source of his difficulties and be better equipped to work together with his adhesive supplier or paper manufacturer to clear up the problem.

The first step in promoting an understanding of the subject throughout the packaging industry is the selection of a universal method for determining the glueability of paperboard according to its ability to absorb water. To meet their specific needs, manufacturers of packaged products are using a number of methods to indicate the relationship between water absorbency and gluing, but a standard has not been reached to take care of a particular industry's problems satisfactorily.

The biggest single factor affecting universal "water-absorbency vs. glueability" standards has been the lack of a standard test for determining the rate at which board absorbs water. A number of tests, now in use, have proved valuable. Examples include the Cobb test and the "oil droplet on an inclined plane of board stock" test.

Trend Of Testing

However, the present trend is toward the simple water-drop test, which is used to check both the absorption and wetting action of water on a sheet. This test reveals not only the time required for the board to absorb the water but also tells if wetting-out has occurred during the first 15 seconds of the test. The short compression time in speeded-up equipment makes this wettability test very important.

Results of the water-drop test seem to tie in closely with today's high-speed packaging requirements. They are indicative of how a particular board stock will perform on an automatic package maker or high-speed carton sealing machine.

The water-drop test seems to be looked upon favorably and is fast becoming a common means for specification by many carton manufacturers and their customers. The popularity of this test probably lies both in its simplicity and the effective control it provides. Through the use of various control methods, a number of board manufacturers have developed generally acceptable absorption-time

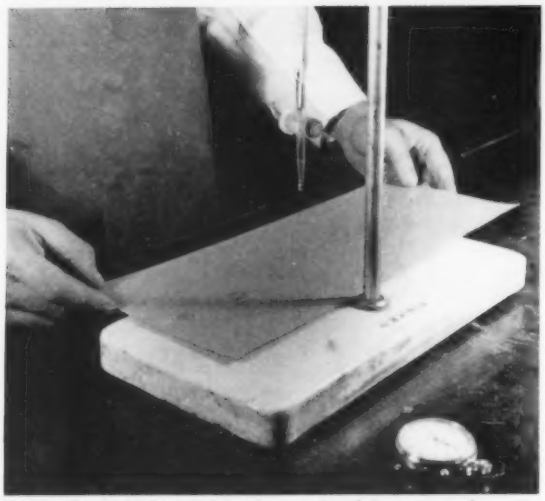


Fig. 1. Chemist in the act of running a series of drops across the paperboard sheet to run a water drop test.

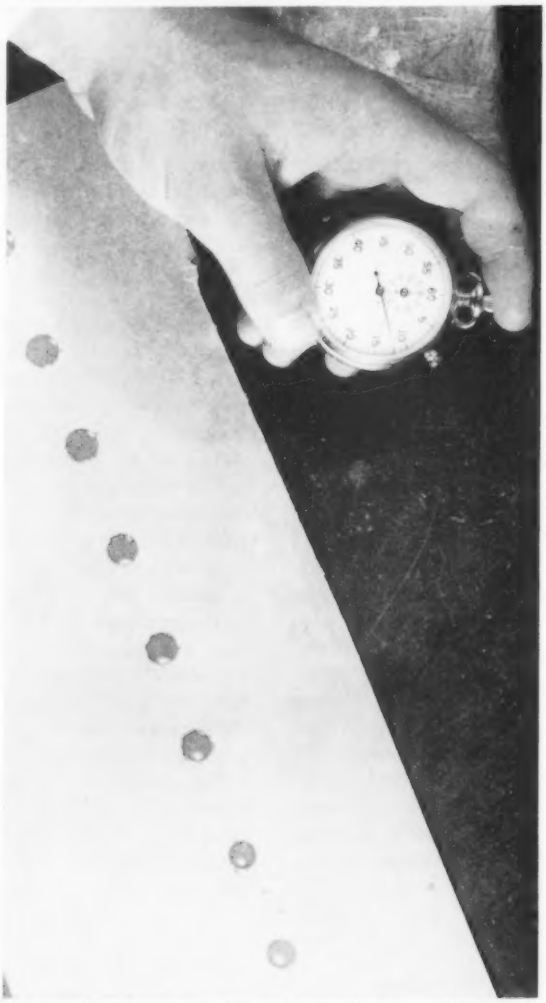


Fig. 2. Water drops on the sheet after an elapse time of 12 seconds. The sheet has darkened under the drops showing good initial wetting and indicating absorption has started to take place.

standards for carton stocks.

These usually fall within 300 to 1500 seconds for the top of the sheet and 0 to 120 seconds for the back. On most regular chipboard carton stock, for normal carton-sealing using dextrine adhesives on a high-speed line, the time for a 0.1 ml. (approximate) drop of water to disappear from the face or back of the stock is usually within the time ranges stated above.

Absorbency Variation

On the whole, board and paper manufacturers are doing an excellent job of controlling quality from shipment to shipment. However, some variation in absorbency is to be expected. A testing program for paperboard water absorbency in the packager's plant will pay dividends in reducing lost production. All it takes is the advance sampling of all incoming shipments of paperboard by a simple, fast test such as the water-drop test. In this way, the packager can determine the rate of wettability and absorption.

In advance of a production speed-up, a change in adhesive adjustment or a different adhesive may be required to accommodate the present stock on hand. A small-scale production test will reveal the suitability of the present board and adhesive for this high-speed equipment. If the production test yields poor seals, the packager can report the results obtained in the water-drop test and the production test to his adhesive supplier. As a result of this advance testing he can eliminate production losses.

The same testing procedure can be employed on new packages contemplated for existing packaging lines.

Water-Drop Test

The following is a simple outline of the water-drop test; the specifications used are for normal chipboard.

All test specimens should be reasonably representative of the stock being tested. The test should be performed on those areas that will be glued. The required apparatus consists of a standard dropping bottle or burette, distilled water, and a

timer or stop watch.

From a height of six inches above the surface of the board, rapidly drop a series of water drops 0.1 ml. in size approximately 1½" apart across the surface. Start the timer as soon as the first drop has been placed on the board. Note the time required for the drops to darken the surface of the board. This result indicates the wettability of the board.

Normally, board run on high-speed machines should wet out within 15 seconds. Then note the elapsed time as each droplet disappears into the board. Stop the timer as soon as the last drop has disappeared. Average the elapsed times. The result will indicate the rate of water absorbency of the paperboard. The report should show the average time in seconds for each of the individual specimens and also the average of all specimens tested.

The water-drop test is sometimes simplified by using an eye dropper. This quick test yields reasonable results, especially when care is taken to get each drop close to 0.1 ml. in size. If the droplet is not 0.1 ml. in size the figures stated below do not apply.

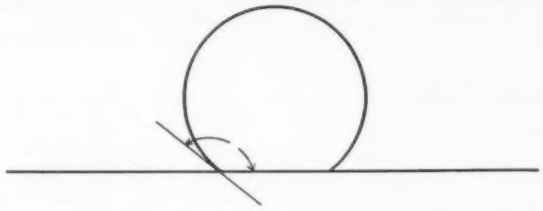
Ranges Of Results

For common adhesives, the averages of individual specimens should fall within the following ranges: Back of sheet, zero to 150 seconds; top of sheet, 300 to 1500 seconds. As always, there are exceptions to these rules and individual specifications may vary from those given above, but usually these figures are practical for chipboard cartons on a normal automatic high-speed carton-sealing operation where a dextrine-base adhesive is used.

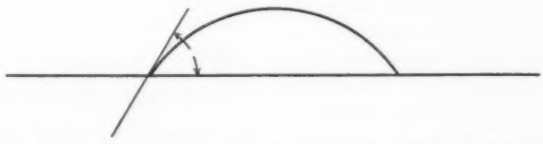
Usually, when the top of the sheet has a high reading, the bottom should be close to the upper limit of its range. It seems to be the proper relationship between the absorptiveness of the tops and backs of the sheet that determines good glueability of the board, especially if heat is used to accelerate the drying of the adhesive. For example, if the back of the board is highly absorbent and wets out easily, and the top has very low absorbency and wets out poorly, the back will absorb the moisture in the adhesive very quickly, before the top has had the chance to wet out.

This problem is more pronounced in the presence of heat and pressure; heat dries up the moisture before it has had the chance to wet out the top of the sheet, and pressure tends to force the moisture into the highly absorbent back. The result would be a poor bond because effective bonding requires wetting out and penetration of both surfaces when a dextrine-base adhesive is used; in this case another adhesive is necessary.

Fig. 3. Visual approximation of contact angle by drop appearance



a. Drop stands up above surface; low wettability, high contact angle.



b. Drop spreads on surface; substantial amount above surface; moderate wettability; moderate contact angle.

c. Drop lies almost flat; high wettability; low contact angle.

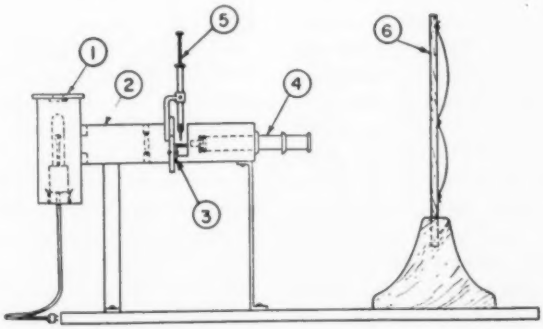


Fig. 4. Apparatus for determining contact angle:

1. A ventilated lamp house containing a 250-watt projection lamp. 2. A tube containing a lens to concentrate the beam of light. 3. A horizontal stage to hold the sample under test, the stage to be adjustable vertically. 4. A microscope draw tube fitted with a 25-mm objective and a 5X ocular mounted horizontally beside the stage. 5. A syringe, such as a 1-ml. hypodermic, equipped with a No. 27 stainless steel needle. (This gives 150-200 drops per ml.). 6. A frosted glass screen with clamps to hold a sheet of paper.

Trend to higher speeds

Increasing emphasis on the higher speeds of packaging lines means that there is going to be less time and less space in which to accomplish the sealing operation. We are going to hear more and more about the ability of paperboard to glue rapidly. Those expert in the management and operation of high-speed packaging lines assert that there must be the closest relationship between the absorption of the board and the time available in which to do the gluing job. All this places a special premium on the availability of practical tests of water absorbency. Such practical tests help a user anticipate the problems inevitable in stepping up an operation.

Contact Angle Test

In special cases, when a highly sized stock is used, wettability and rate of water absorption can be determined by a measurement known as the "contact angle". With this type of stock it is impractical to use the water drop test because of the length of time required for the water to enter the board. The contact angle is formed by the surface line of the board (base line) and a line drawn tangent to the water-drop surface at the point where the droplet intersects the base line.

It is usually easy to get an indication of the contact angle visually while the water-drop test is being conducted. In this case, only the appearance of the drop is noted (stands up, flat, etc.) See Fig. 3. More precise measurements can be made in the laboratory.

Equipment necessary to measure the contact angle consists of a contact-angle tester, (see Fig. 4) distilled water, a timer, hypodermic syringe, protractor, and a lined pad (8½ x 11 in.). First prepare a ¼ x 3½ inch strip of the sample being tested, place the strip in the contact angle tester with the side to be tested facing up. Connect the tester, and have the light reflect on a piece of lined white paper. Allow a drop of water to fall on the center of the sample directly in front of the light, and focus until the bubble is clearly visible on the paper. Then move the lined paper until the flat base of the bubble rests on a drawn line.

After the bubble has remained on the sample for 15 seconds, measure the angle formed by the base line and the line tangent to the water-drop image where it intersects the base line. When the drop has remained on the sample for one minute, repeat the measurement. The first contact angle reading can be considered as a measure of wettability. The greater the angle, the less the wettability of the board. The rate of change of the contact angle at timed intervals indicates the rate of absorption.

Problems Solved By Testing

Following are some typical problems where absorption of the board caused adhesion problems: A large manufacturer of packaged products suddenly began to get poor bonds consistently after he speeded-up the line, although previously there was satisfactory bonding with the same machine adhesive and cartons. A water-drop test indicated that the rates of wettability and water absorption of the sheet fell within the normal range.

However, the dextrine adhesive used required a longer compression time than was available with the speeded-up line. A resin adhesive, recommended by the adhesive chemist, solved the problem. The packager was able to use up the board on hand. In a subsequent consultation with his paper manufacturer and printer, it was concluded that a slight varnish overlay on the top sheet had caused the trouble in the speed-up. The problem was corrected by the printer allowing the original adhesive to be used again.

In another case, a new package was developed and was scheduled for production without the advance testing previously mentioned. When this carton was put on the high-speed carton sealing machine, it was found to be impossible to seal using the same dextrine adhesive normally used for their other work, and still maintain full production speed.

What Tests Reveal

A hurried call was put into the adhesive supplier, who ran a quick absorption test which showed that the top of the sheet, of the new container, had a very low absorption rate. This was due to a special surface coating which had been requested on the new board. This sealing problem could easily be corrected by the use of a normal resin adhesive to obtain full production speed and this recommendation was made. The manufacturer complained that the use of resin would involve costly clean-up time when he switched back to his other containers, where he would use dextrine adhesives — as his experience had been that the two adhesives were not compatible.

The answer was found in the use of a resin adhesive that was completely compatible, even when mixed directly with a dextrine carton sealing glue. This versatile product enabled him to switch from a dextrine to a resin adhesive when the new package was run without the thorough cleaning and neutralizing of the glue system normally required.

Variations in absorption of water into paper stock will continue to live with us as our use of paper and paperboard grows. It is of increasing importance to adopt a common means of testing water absorption and wettability that is universally acceptable to both paper and paperboard manufacturers, adhesive manufacturers, as well as the people who convert and package with their products.

In this way the problem can be discussed from a common meeting ground. Although it will undoubtedly be some time before this measure is accomplished, the desire to resolve industrial problems through mutual cooperation between the manufacturer and the customer is overcoming many of the hurdles of previous years.

Martin S. Peterson is a graduate of Reed College with an A.B. degree and of the University of Nebraska with M.A. and Ph.D. degrees. For 20 years he taught English at the university and for five years edited the agricultural publications of the university's college of agriculture. In 1946 he became technical editor of the western Regional Research Laboratory of the U. S. Department of Agriculture, and a year later joined the Food and Container Institute. He has written several books and some 35 articles in the fields of literature, history, and food technology. He is a member of Sigma Upsilon, Phi Tau Sigma (food science honorary society), Alpha Gamma Rho, and the Institute of Food Technologists.

Packaging specialists often are hard put to find the time necessary to make a general survey of the technical literature of their field — other than when pressed by the needs of a particular project. Here is a running review of recent research and technology in the field of food packaging. Dr. Peterson's article contains a combination patent search and literature review representing the past 18 months.

Technical developments in food packaging

By Martin S. Peterson,
Chief, Technical Services Office, Quartermaster Food and Container Institute, Chicago

A considerable transformation has occurred in food packaging in recent years — even in the past 18 months. New methods, new systems, new theories, new materials, improved materials have contributed remarkably to protect foodstuffs additionally through processing, transportation, storage, and marketing operations. Some of the notable advances of recent months concern the addition of flexible properties to packaging materials that (1) assist in inhibiting oxidative rancidity, (2) insulate the contained product from gases and vapors, (3) resist the effects of extreme temperatures, and (4) prevent water-vapor transfer. Also advanced during this period were: Special packaging designed for individual foods, new packaging machinery, and container methodology. New ideas came forth in a flood that resembled the horn of plenty.

In reviewing recent advances in food packaging research and technology, a few broad trends become evident. It is apparent, for example, that the addition of "properties that nature forgot" are being added to packaging materials — for example, in plastics, resistance to high and low temperatures. Creativeness is on the increase with respect to protective devices for the safekeeping of foods, convenient features for the housewife, and utilitarian advantages for the handler; witness the new ideas in containing granular products, in dual purpose packages (shipping container and storage bin). Concern with the effect of product on container material is also more and more in evidence.

Antioxidants in packaging techniques and materials. Developments in this area have been little short of spectacular. B. L. Sarett and D. Scott (U. S. Patent 2,765,233, Oct. 2, 1956) devised a moisture-proof, gas-permeable fabric sheet, coated on the surface in contact with the product, that inhibits oxidative degradation in air-wrapped foods of comparatively high moisture content. Glucose oxidase is the "secret weapon."

This enzyme system effectively removes 0_2 from sealed containers and also from the air diffused through the sheet. 0_2 reacts with the glucose to form a gluconic acid compound at the interface between sheet and product. J. C. Pullman and R. B. Porter (U. S. Patent 2,758,032, August 7, 1956) using rosin-sized paper worked out a package protective against oxidation by applying an antioxidant, 2, 2′ methylene bis — (4, 6-dialkylphenol).

Application of Ionol CP antioxidant to paperboard has been reported as successful by M. E. Doyle, R. D. Sullivan and H. G. Booth in *Modern Packaging, 29* (11) 119 (1956). J. Masek, writing from behind the Iron Curtain *(Obaly,* 2 (3) 100, 1956) found some success in protecting but-

ter against oxidation by impregnating the parchment paper used for wrapping with quercetin combined with citric acid and other flavonoids. H. A. Toulmin (U. S. Patent 2,790,-721, April 30, 1957) has developed a protective dextran film for foods that coheres to and protects the product.

Oxidation has also been inhibited by introducing a deoxygenating agent into the package. B. L. Sarett (U. S. Patent 2,578,932, August 14, 1956) developed a process whereby such an agent is introduced directly into the container. It is insulated from the product by a coated sheet into which is incorporated the glucose-oxidase enzyme system mentioned above.

Use aspects. This whole matter of plastics in relation to their use as food containers was given much consideration in the literature of the last twelve to 18 months. Here is an interesting sidelight to start out with: R. L. Worrall, an Englishman, called for caution (*Proc. Nutrition Soc., 15,* 16-17, 1956) in using plastics since, despite their chemical inertness, they can and do produce biological effects.

Reminding his listeners, (the Leukemia Society) that carcenogenesis can be initiated by neutral fat antioxidation, by irradiation, or chemical agents, he mentioned the relevancy of this theory to plastics and their possible involvement in fat antioxidation. Mention of radiation brings up the study of M. Karel and B. E. Proctor, (*Modern Packaging, 30* (5) 141, 1957) in which it was pointed out that the conventional moistureproof cellophanes require some improvement if they are to be used with irradiated foods of high moisture content.

Application of new packaging films to foodstuffs are numerous. H. Nagel and J. P. Wilkins (*Food Technol., 11,* 180, 1957) report on the versatility of "Mylar" polyester film. Its melting point of 250° C. suggests a rosy future with regard to the possibility of sterilizing foods in a flexible package. Space-weight saving, particularly weight, is the great advantage.

Polyethylene continues to be studied with vigor. Modifications of polyethylene were worked out by A. W. Myers and co-workers at Syracuse University (*Modern Plastics, 34,* 157, 1957) to achieve low gas and vapor transmission rates. Radiation, a paper substrate, grafting other monomers to the polyethylene were some of the modifications tried. K. A. Kaufman (*Modern Packaging, 30* (8) 137, 1957) developed evidence to show that new high density, high pressure polyethylene will withstand high temperatures (boiling) and not go soft.

H. G. Chinn (*Modern Packaging, 30* (4) 153, 1956) developed a new technique for sealing polyethylene film, paper, polyethylene coated paper, and polyethylene laminates. Abandoning the method of applying heat *through* the layers, he extrudes hot polyethylene *between* two layers of film.

Special packaging for products. Developments in the packaging of particular products came in thick and fast. C. M. Carson (U. S. Patent 2,772,172, November 27, 1956) proposed preserving the red color of fresh meat by wrapping the product in a transparent film (one ply) composed of ester plasticizer and rubber hydrochloride. The surface next to the product is coated with a hydrophilic (water-loving) material that precludes the fog that otherwise would develop.

E. Flomen (Canadian Patent 537, 706, March 5, 1957) hit upon a package for sausage casings — a waterproof bag that holds a number of casing units. Each unit is supplied with a long flexible band shirred at the usual tubular sausage casing lengths. J. D. Ingle and A. N. Naurocki (U.S. Patent 2,753,-268, July 3, 1956) placed a claim on a method for packaging cheese that inhibits mold growth. They used a pliable, flexible wrapper, placed the cheeses (pasteurized or fully cured) in the wrap, flushed the package with carbon dioxide, drew a vacuum and sealed under vacuum.

A. B. Erekson and J. R. Palmer (U.S. Patent 2,768,055, October 23, 1956) devised a method of cheese packaging whereby all air is pressured out of the wrapper. Canadian inventors (Canadian Patent No. 534,-216, December, 11, 1956) found and patented a method for getting soft, molded foods, such as jello dessert, out of the package without mutilating the molded form of the food. They employed a thin flexible film that forms a reversible "pocket." The pocket is supported by semi-rigid materials. Basic trick in releasing the product without deforming its shape is tapering the wall of the pocket, which permits inverting the pocket and pulling it cleanly from the product.

British inventors have devised a flexible container (British Patent No. 752,720, July 11, 1956) for cake mixes which features a flap that assists in metering out the product. A liquid measuring device, also included, combines to make it possible to mix the butter within the container. H. P. Montminy (U.S. Patent No. 2,772,171, November 27, 1956) proposed a method for packaging cake mix and frosting by packaging each item separately and using an outer container to provide a unit package.

L. E. Bliley (U.S. Patent 2,768,-086, October 23, 1956) has worked out a technique for packaging in frozen form a combination dish such as spaghetti and meat sauce. After the sauce is frozen within the container, (in the form of a layer or block), the spaghetti or other dried product is filled in. The container is then closed and placed in the freezer. A moistureproof, semi-rigid, heat-resistant sheet material is the packaging material.

Greasy foods or greasy food ingredients, always a packaging problem, behave well in a package devised by M. J. Galbraith (Canadian Patent No. 532,863, November 6, 1956). A carton formed of lined paperboard impregnated with hydrogenated peanut oil does the trick. A chemical is used in the liner to inhibit discoloration of the paperboard by the peanut oil.

Many New Techniques

Refrigerator cookies, a popular item, are effectively packaged under a technique devised by B. Selmer (U.S. Patent No. 2,739,955, May 28, 1957). Use is made of a lower sheet

on which the cookies are placed and an upper sheet which can be crimped and hermetically sealed into compartments. These "cells" encase the cookies individually. Each such compartment can be removed manually when needed.

C. Olin Ball, a prodigious contributor to the technology as well as the theory of food processing, and R. Baker (U.S. Patent No. 2,789,058, April 16, 1957) found a way to prevent food products from burning to the walls of cans by laying on a thin layer of H_2O between foods of thick consistency (the only ones susceptible to this treatment) and the ends and sides of the can. Ball and co-workers are running a series of articles evaluating packaging for fresh meat in *Food Technology*, Volume 11, 1957.

Incidentally, for those desiring a quick run-down on new packaging methods for butter and cheese products, R. E. Eldred (*J. Dairy Science, 40, 323, 1957*) has furnished much information of value. Also valuable and informative was A. J. Lehman's survey of new packaging developments (Assoc. Food & Drug Officials, U.S., *20*, 159, 1956). Container materials currently in use for foods were tabulated therein.

The great potentials of aerosol packaging were reported by Earl Graham in *Food in Canada, 30*, June 1956. Graham offered the thought that viscous foods which cannot be aerated may be susceptible to the use of an inner plastic container surrounded by the propellant gas. The pressure of the propellant acting on the inner bag or container exudes the product. Technical aspects of aerosol packaging (three-phase system foam packs) are also discussed by A. Herzka (*Perfumery and Essential Oil Record, 48*, 176, 1957).

Testing. Test procedures and results are plentiful in the literature of the past 18 months. C. L. Brickman (*Food Technol. Digest* No. 34, January 1957) describes the measurement of gas permeability of pouches and gives quantifying data. B. E. Proctor and A. Cornell (*Food Technol., 11*, 141, 1957) offer a procedure for evaluating permeability of organic vapors (flavor) using the Lang-Farber permanganate process.

Since Dr. Peterson prepared this article for inclusion in the issue containing our cumulative annual index, he has minimized his citation of material appearing in PACKAGE ENGINEERING. Therefore, his article and our index complement each other and we urge readers to make use of both.

Results on several materials of interest to food processors are reported. E. Cernia (*Materie Plastiche*, 22, 361, 1956) lists the permeabilities of vinyl chloride, the polyethylenes, rubber, cellulose acetate, and other materials in a battery of tables and charts. A cellophane pliability tester was offered by J. D. Conti (*Modern Packaging, 29*, 124, 1956). Conti found moisture content to be the critical factor in cellophane stretchability.

The gas permeability of various flexible films can be rated by a simple tool reported by R. Henderson and G. A. Wallace (*Food Technol., 10*, 636, 1956). The Perkins-Southwick instrument for testing the bonding power of coatings was discussed by J. E. Guillotte and C. P. MacDermott (*Modern Packaging, 30*, 157, 1956). The mathematics of permeability is presented by B. Hilton (*Package Engineering, 2*, 28, 1957). Physical and chemical theories were employed by Hilton to work up a foundational equation for water-vapor transmission.

Margaret Ives (*J. Am. Diet Assoc., 33*, 347, 1957) devised screening tests to select safe packaging materials for new products. The toxicological status of many new materials was previously unknown. Tests looking toward the prediction of corrosion of packaging materials in storage were revealed by R. B. Turnbill (*Chemistry & Industry*, 446, 1957).

Speaking of corrosion, F. W. Salt and J. G. N. Thomas (*J. Applied Chemistry, 7*, 231, 1957) found chrysanthemin, color pigment of plums and raspberries, to be the "trigger man" in the corrosion of tin by citric and malic acids. Test for this substance was offered.

New ideas galore. A multitude of new ideas was offered in 1956-57. A new liquid filling machine whereby 300 cases, twelve to the case, can be filled per hour by an operating crew of five has been developed by one manufacturer. Cases of bottles are handled in one pass. O. H. Hedstrom (U.S.Patent 2,755,213, July 17, 1956) came up with a laminated absorbent paper utilizing an outer sheet impervious to grease and an inner sheet of wood pulp and diatomaceous earth.

Industrial Research Newsletter (2, May 1957) called attention to a new electronic device for maintaining net weight of packaged products at constancy. Close tolerances in high-speed packaging lines are attained. P. Sherrock, incidentally, reviewed (*Food in Canada, 17* (2) 34, 1957) the classes of instruments available for controlling temperature, density, flow, weights, etc. A neat summation of principles and modes of action is included and new developments were touched upon.

A new idea in cartons for sugar, salt, meal, etc. was made available through a British Patent (752,745, July 11, 1956). The concept is based on overlapping flaps ingeniously devised to prevent sifting losses. Another British Patent (752,725, July 11, 1956) introduced a wooden box that lends itself to stacking and binning products in constant use. Main feature is a removable side piece to allow removal and/or inspection of the contained product.

A high speed multiple can-packaging system was reported (*Food Processing 18* (2) 72, 1957). Cans are cartoned from the *top* of the set to be packaged, *down*. The carton is then glued and locked at the bottom. Sizes from that of the orange juice can on to quart cans can be packaged under this system. Noteworthy saving in floor space is effected. F. F. Starzyk (U. S. Patent 2,757,093, July 31, 1956) created a method of molding and sealing plastic foods.

The food is heat sealed between two sheets of air-proof, moistureproof material in the same operation whereby the food mass is molded to shape. An automatic packaging line for dehydrates was also reported (*Packaging Abstracts*, 14,1061, 1957).

Significant Trends

Recognizing the notable contributions which packaging technologists, scientists, and engineers have made, special attention might well be given to some recent advances and trends. It is evident that there is no let-down in the pace of technology and engineering. In recent months it has become apparent that in the food packaging field, technical studies are tending more and more to concentrate on "problems within problems" — a trend that set in with regard to the technology and science of food some time ago.

In packaging, as in all technologies, the day is long past when one man has all the answers. In fact, the rather broad-gauge packaging article of two decades ago is seen more and more infrequently, and taking its place is the article that delimits itself to a problem phase — even a phase of a phase. The broad categories of technical concern remain the same:

Projects that will result in mechanical features that facilitate or accelerate food packaging unit operations — filling, closing, labeling — or make for easier, better storing, handling, or shelving by the consumer; fundamental physical problems, the solutions to which will minimize impact injury, vibration damage, and environmental strain generally; prevention of contamination by molds, bacteria, etc. or by other external hazards (moisture, heat, cold); the problems in the adaptation of packaging materials to foods, e.g., improving "interior environment" of the container.

Case studies of over-all cost reductions in manufacture are also on the increase. Perhaps a quicker way to state this is to say that the specialists have now pretty well staked out claims within three broad areas: (1) Functional improvement (use features); (2) physical improvement (including design); and (3) protective improvement (insulation of product from contaminants and deleterious environments, generally). The number of productive specialists in each of these areas is on the increase.

Functional improvement problems have received the attention of a number of ingenious people during the past three months. A major breakthrough in aerosols was reported in September (*Food Engineering*, Sept,. 1957, p. 20). New valve and actuator designs plus control of gas equilibrium promises the food field more versatile aerosol packaging — a package, for example, that will dispense foods in non-foaming sprays or, if desired, streams.

Functional improvement, by the way, is a standing objective of the military forces. Not yet in the packaging bibliographies but well along toward technical definition are packages that can be used for man-carried rations that will serve as containers, as heating utensils, and as serving ware. The new temperature tolerant films contributed to the solution of one phase of the problem. Research and development are being continued by the U. S. Army Quartermaster Corps to improve present prototypes of this multi-purpose package. A long, long way from definition is packaging for long-range aircraft — and by long-range is not meant the 48-hour or 96-hour sustained flight of yesterday. In the light of recent events, one dares to say that articles on packaging for space travel may be in the literature in the foreseeable future. Such packages will have to be functional with a vengeance.

Physical problems have continued to be isolated and progressed toward solution in recent months. Testing methodology has a prominent place in this category. F. D. Long and G. G. Maltenfort (*Fibre Containers and Paperboard Mills*, Sept. 1957, p. 82) report that the need for a bender test for fiberboard has been fulfilled. A new testing instrument, a scoring press tester, was developed whereby the scoring or creasing characteristic of folding carton stock could be developed. A new test and test instrument for evaluating the folding and gluing qualities of carton stock is described in the same issue of this journal (p. 88).

Radiation "curing" of epoxy resins (used for coatings, adhesives, insulation) to form rigid plastics without heat is shown to be possible with compositions that permit vinyl polymerization according to Colichman and Strong (*Modern Plastics*, *35* (2) October 1957, p. 180).

Critical Permeability

Improvements in the protective properties of packaging have been offered by numerous investigators. In September of this year Paul C. Pinco and John C. Ayres (*Food Technol.*, *11*, 461, 1957) reporting on pigment changes in packaged beef during storage, addressed themselves to the several factors involved, but spotlighted the importance of the gas permeability of a packaging material — a critical factor of great importance. Fresh meats packaged in gas impermeable films appear to reoxygenate to give the desired oxymyoglobin (which accounts for the bright red color of meat) for 12-14 days at 4.4°C. These investigators furnish criteria to compare the efficacy of various packaging films with regard to pigment changes.

Carlos A. Greenleaf and James M. Reed, reporting in (*The Glass Packer*, Sept. 1957, p. 46) on tests on glass-packed items after being submitted to a nuclear blast, found that food so packed is safe for consumption. At 4700 feet and further from ground zero, six hours after the explosion, food was suitable for immmediate use. Food recovered after three or four days from an area of complete destruction may be used and will have normal flavor and texture.

Conclusion. Spot-checking the advances in packaging technology reveals a truth not always recognized that without modern packaging technology and engineering, the immense reservoir of man-created new resources in films, paper, metal, and wood would be, economically speaking, impotent. It is not too much to say that the technological energy of the past 18 months has converted these new resources into useful new or improved containers at a geometrical rate.

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Here is a specific solution to a vexing problem. Packaging specialists concerned with what is their equivalent of the unit operation of the process engineer may find this simple, effective approach helpful to them.

Dust collector on powder filler prevents fine powder from drifting around plant

The problem of the escape of dust from a powder filling operation is sometimes only a mere annoyance, but if the dust possesses alkaline properties (like "Bowl Cleaner" for cleaning toilet bowls, made by Stanley Home Products, Easthampton, Massachusetts), it is desirable to avoid permitting the dust to drift around the plant. Prevention can be accomplished in two ways:

1. Put the filling operation in a dust-tight room;

2. Collect the dust at the filler, and thus prevent it from blowing around with every air movement.

Stanley Home Products chose the latter method. It is simpler and cheaper than building a room around a dusty operation. Further, there are no doors or walls to interfere with bringing up supplies of empty containers.

The Nalbach rotary volumetric filler drops the powder into measuring tubes that, in turn, deposit it into the empty cans. Air in the empty container must be allowed to escape for, otherwise, the filling will be irregular. But the escaping air will carry with it small amounts of the finest particles of the product. It was decided to collect the dust at this point.

Stanley's plant engineering department designed a flattened funnel with the large end curved to fit the curve of the filler, and wide enough to extend over the height of the containers. This collecting funnel, made of galvanized sheet steel, is hooked up to an exhaust fan and dust separator as shown in the accompanying illustrations.

In operation the exhaust fan, powered by a ½-hp motor, draws air from the collecting funnel and forces it through an American Air Filter size-D Roto-Clone dust separator.

Experience has shown that both fan and Roto-Clone are a trifle larger in capacity than are actually needed. But the device effectually prevents dust from escaping at this point.

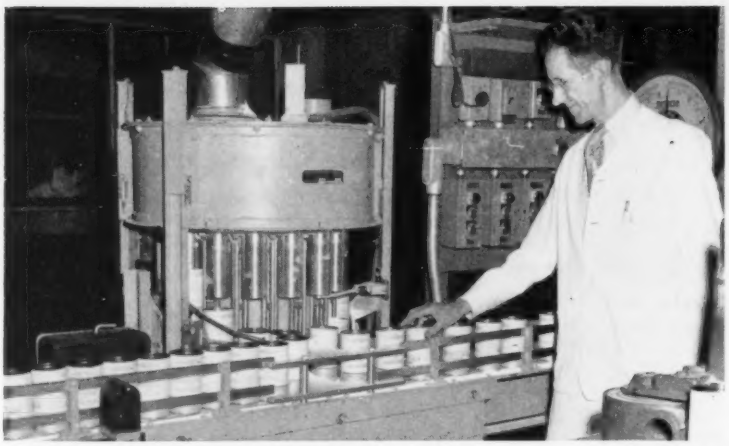

Fig. 1. Front of rotary powder filler showing the measuring tubes. Cans are lifted until tube is near bottom when powder drops into container.

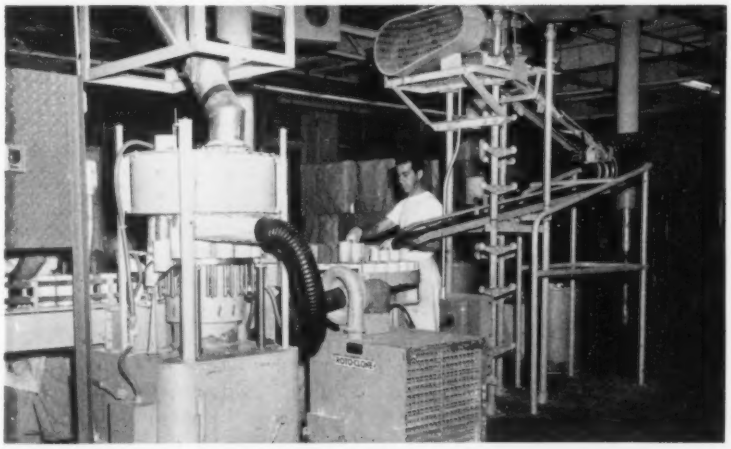

Fig. 2. Simple method of capturing the dust as it blows from top of containers when product drops from measuring tubes into the cans.

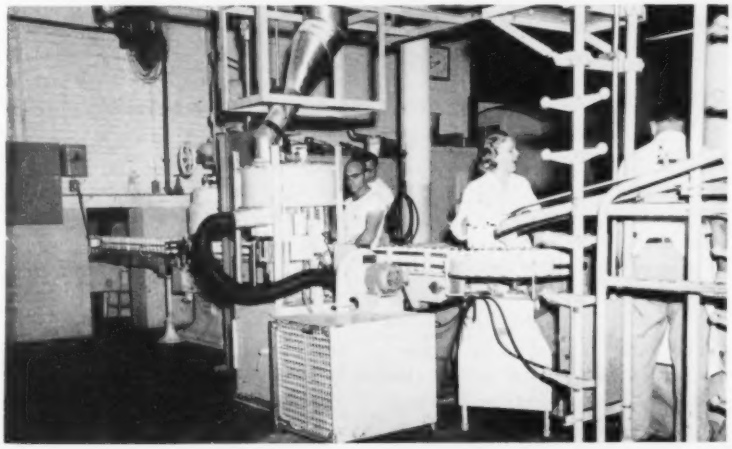

Fig. 3. Flexible 6-inch exhaust hose permits easy installation of Roto-Clone to capture any fines that otherwise would escape into room.

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R. G. Crozier is a graduate of Beloit College, having majored in chemistry. Subsequently, he carried on advanced work in chemistry at the University of Wisconsin. After a period of teaching, he joined the chemical manufacturing department of Abbott Laboratories. He later became plant chemist and assistant manager of chemical manufacturing. Subsequently, Mr. Crozier transferred to Abbott's packaging activities and currently is manager of package standards and specifications. He is a member of the Drug and Pharmaceutical committee of Packaging Institute and is chairman of its sub-committee for the standardization of metal and mold closures. He is a member of American Chemical Society and has attended the Purdue Institute for Packaging Personnel in 1955 and 1956.

Here is an over-all review of the basic problems encountered in the selection and application of flexible packaging materials. Mr. Crozier's emphasis on a check-list approach and a systematic review of pertinent factors deserves careful attention. Those just getting into the use of flexible packaging materials have the benefit of many apparently simple pointers, which Mr. Crozier and his opposite numbers elsewhere have gained only by hard-won, practical experience.

Practical applications of flexible packaging materials

By R. G. Crozier

Manager,
Package Standards and Specifications,
Abbott Laboratories,
North Chicago, Illinois

So you wish to put up a product in a flexible film? Then why not just pick a product name that appeals to you, purchase some film you have read about, and then go to work? Well — it is not that simple.

First a check-list must be developed in order to orient the problem and to crystallize our thinking. We are assuming for the purpose of this discussion that the product to be packaged is a tablet; however, the principles involved are much the same no matter what the actual product may be.

A check-list used at Abbott Laboratories is built about the following questions concerning the product.

1. Is it sensitive to moisture? If so, to what degree?
2. How long must the package protection last?
3. Under what conditions is it to be stored? Temperature, humidity, etc.?
4. Do conditions of transit and use differ from those of storage? How?
5. Are we able to compare its properties with anything with which we have had experience?
6. What are its physical dimensions?
7. Is it mechanically weak?
8. What is its chemical composition and compatibilites?
9. Is it coated?
10. Is it light sensitive?

These are the examples of the kind of information required before starting to work.

You ask where one obtains the answers to these questions. This is difficult to determine at a distance. In a large measure it depends upon the type and size of your organization and the responsibilities of the various divisions. The primary sources of information will be the research, development, and manufacturing departments. Supplementary sources include the sales, traffic, engineering, and other departments, as need dictates. In a small organization it will probably be necessary to dig out the answers yourself.

In the case of pharmaceutical packages, water-vapor-transmission (WVT) is generally the most critical area and this is usually considered first. If the amount of WVT that can be tolerated is known, the first step is to consult tables giving the characteristics of packaging films and select two or three which appear to be within the proper range.

When the moisture sensitivity is not known, we either must perform some screening tests or else make an "educated appraisal" while leaning to the conservative side. Such tables may be found in a number of places, such as in packaging encyclopedias and product information distributed by producers.

Converters of packaging films are very cooperative in supplying information and in passing on the benefit of their experience. (The term

"film" as used here should be understood to include any and all of the laminates which are used in packaging in flexible films.)

What Shelf Life?

Probably the next point to consider is that of "shelf-life" or for what period of time protection is desired. This must be considered when selecting the film, because it is not sound economic practice to use a film with an extremely low WVT when the product is not particularly sensitive to moisture, or when the package is to be stored and used in an arid climate, or when it is to be used within the space of a few weeks.

On the other hand, if it is anticipated that the package will be stored and/or used in an area where extreme conditions of humidity and temperature are to be experienced, such as in some of the Gulf States, it will be necessary to have a packaging film with lower WVT.

If distribution is to be over all ranges of climate, and the volume warrants, consideration should be given to using different films when packaging the product. Similar consideration should suggest restricting distribution so that the best film barrier will afford protection in areas where it is required — with lesser packaging protection destined for areas where the lesser will serve the purpose. In this way, packaging dollars can be stretched quite measurably.

It should be noted that transmissivity of one or more gases may be a problem. In some cases it is necessary to package with nitrogen or carbon dioxide protection. In others packaging may be performed without gaseous protection but oxygen should be prevented from entering the package.

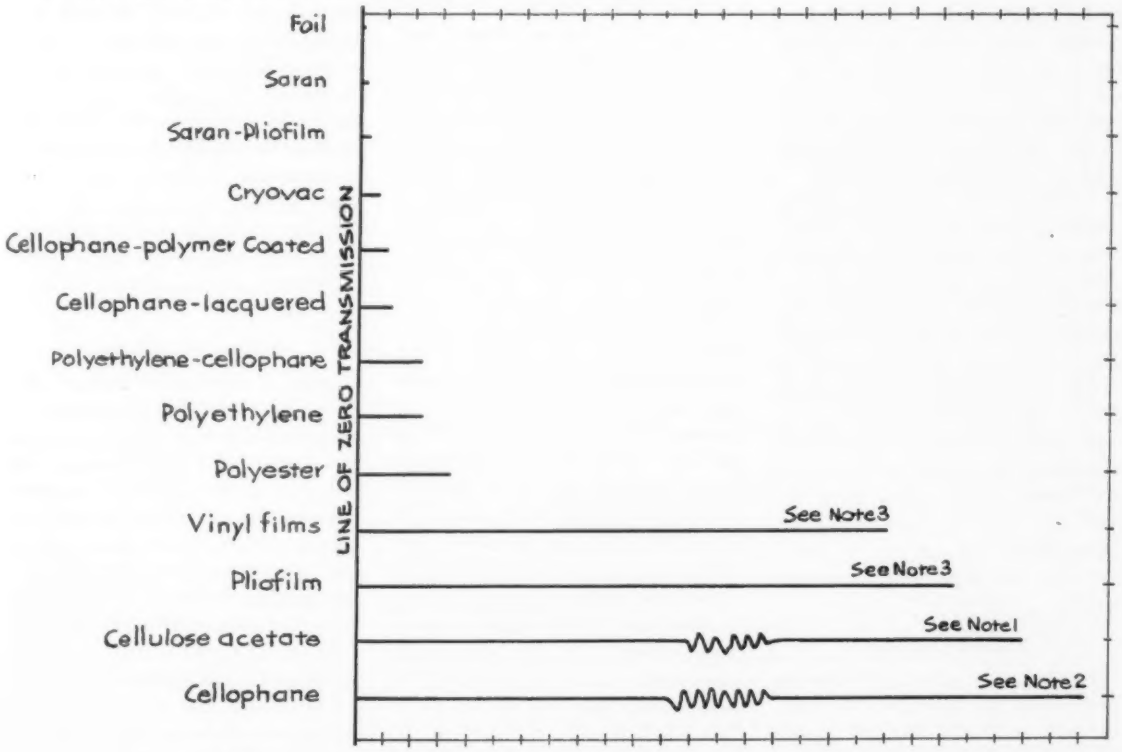
After having tentatively selected one or more films which seem to have the characteristics which are desired, we must consider the chemical nature of the product or its coating. Some packaging films are quite inert, others are compounded of substances which will partially break down and give off one or more gases which may attack the materials involved.

Gas Problems

This is particularly true of a laminate in which the outside layer does not allow the objectionable gas to dissipate and thus increases the

Chart Indicating The Relative Property Of Several Flexible Packaging Films Commonly Used As Barriers To Water-Vapor

Such data are usually expressed in tabular form as the number of grams of water-vapor which will pass through a film 0.001 inch thick and having an area of 100 square inches in 24 hours when subjected to 100° F. and 90% Relative Humidity.



NOTES:

1. The wavy line indicates that the bar should extend 10-15 times the length shown.
2. The wavy line indicates that the bar should extend 8-10 times the length shown.
3. These values are quite variable and should only be used in a very rough comparison.

attack on the product. Some tablets or coatings may on occasion adhere to the films. Thus all of the physical and chemical characteristics are considered which will, in the light of our experience or that of our supplier, indicate the proper film which should be used.

The appearance of the film is very important. All other things being equal, a clear sparkling film is the best choice.

The next step after having tentatively selected some films is to put up sample lots for test purposes. If stub rolls of film chance to be on hand, we are in luck and can start right out. If not, suppliers of the film will be contacted to obtain samples.

Use Custom Packager?

At this point a custom packager may be indicated for any one of a number of reasons. Assuming that equipment for film packaging is available, we may not have die rolls which will give either the right size pocket or the right arrangement of pockets. The number of units that are required and the time element may also indicate that a custom packager should put up at least a portion of the lot. Whatever that decision may be the next step is the same.

A fairly large number of samples will be run just the same as in production. It is necessary to use production or similar equipment for this because we have found that experimental or make-shift procedures do not give valid samples. This is due to the necessity of having the proper balance of temperature, pressure, and dwell time. The number of samples to be run will depend upon the scope of the testing program. This in turn will depend upon the characteristics of the product packaged and the protection that is desired.

Realistic Testing

In a testing program one endeavors to simulate the conditions to which the package will be subjected in storage, in transit, and at the point of use, only to make the tests more rigid than the conditions anticipated. In the pharmaceutical industry this usually means that the package is subjected to high humidity and elevated temperature.

The conditions and the duration of the test will be decided upon after carefully analyzing the ultimate requirements. They will vary from product to product and from one manufacturer to another. Sometimes it is desirable to use a cyclical test wherein one alternates conditions of moisture or temperature, or both.

This test is run concurrently with each of the films which have been tentatively selected. The samples are examined periodically and checked against control samples. At the end of the test period the observations are tabulated and analyzed so that one does not overlook a slight indication of a possible future problem with the package.

If it is determined that two or more films protect the product satisfactorily, ordinarily the one having the greatest yield per dollar of cost will be selected. "Cost" is used in the sense of total expense — labor, machine time, material, waste, overhead, etc. — although in some instances physical considerations of appearance will indicate a more expensive film than might be selected.

Area-Contents Relationship

A consideration that might not be lost sight of is the relationship between the area of the film forming the pocket and the amount of product enclosed. This becomes increasingly important when one is packaging a powder which readily absorbs moisture and forms a hard cake. It is apparent that it may be feasible to put up a relatively large amount in a film package, but not a small or "one-dose" quantity. This is the reason that foil is so frequently employed in such a situation as it is comparable to glass in WVT.

Aluminum foil by itself, particularly in thin gauges, is not a very satisfactory packaging medium. It tears easily, does not seal to itself, and has a decided tendency to develop pin-holes. These objections can be largely overcome if it is laminated to acetate, and has a heat-seal coating on the foil side.

The acetate forms a good solid back for the foil and 0.0015" foil on acetate is virtually without pin-holes.

With reverse printing, that is the printing is on the under side of the acetate film, we have a beautiful scuff-proof package. Foil may be used on one side and transparent film on the other side to give a very attractive package. However, the WVT is but slightly better than that of the transparent film used.

Assuming that a film which meets the packaging requirements (product protection, appearance, and pocketbook) has been selected, we are ready to go into production.

Watch Equipment

During production a close check must be maintained to ensure the proper functioning of the equipment used. As was mentioned earlier, it is imperative that a proper balance be maintained between the temperature, pressure, and dwell time. Poor sealing of the film or de-lamination are two common results of imbalance. The pockets will be checked frequently to be sure that all is well.

"Rule of thumb" methods involve pressing the pocket between the thumb and forefinger to determine whether or not air can be expelled. Another test frequently used is to place the pocket on the floor and then step on it with the sole of the shoe. Neither of these is satisfactory when testing a moisture sensitive product, however.

Making Vacuum Test

A much better method is to submerge a sample in colored water in a desiccator and to apply vacuum to the system. Any capillary leaks will show at 25-28 inches of vacuum; however it is more usual to use 5-15 inches of vacuum and when released the colored water will generally enter the package if leaks are present. The vacuum test will usually show a "leaker" when the seal is not secure or when the male die has "bottomed" in the female die at the edge of a pocket, although the rough test may not. Holding the sample up to a strong light will also allow one to inspect for "bottoming" (showing puncture).

If the sealing conditions have not been correct, the vacuum test may pull the films apart, particularly with the higher vacuum. Of course, if the product is stable with respect to moisture, such a test is not indicated. However, it is unsound practice to select an expensive film with low WVT and then to pass an inferior seal.

Usually production failures result from incorrect equipment adjustment, which can be readily rectified. Once in a while the film is at fault. In such cases, the only solution is to remove the roll and put on another. In extreme cases, one is forced to shut down the equipment and send for the converter's technical representative. This is seldom necessary and is generally required only when using new and relatively untried laminates.

Production problems may arise due to improper storage of the film. Flexible packaging films should be stored in an area where humidity and temperature are kept within the limits prescribed by the converter. Otherwise we run the risk of excessive moisture loss in some films, or stresses may be set up in certain laminates which will cause the rolls to telescope. If this occurs the rolls will have to be rewound before being used.

A Summary

To recapitulate:

1. Prepare a check-list which meets your particular requirements.
2. Obtain valid answers to as many of the questions as possible.
3. Select one or more possible packaging films either by studying tables of the characteristics of films or by consulting your converter, or both.
4. Put up samples for testing purposes.
5. Determine what tests are required and test under exaggerated conditions of storage, transit, and use.
6. Compare the test results with a standard.
7. On the basis of the tests select the proper film.
8. Be sure that you are right and then, and only then, go into production.

Labeling Lines

by George L. N. Meyer, Jr.

FACTORS INFLUENCING SUCCESSFUL LABELING

Successful labeling depends upon several factors including the size and shape of the label as well as the size and contour of the surface being labeled. Good judgement on the part of the user is most important.

THICKNESS

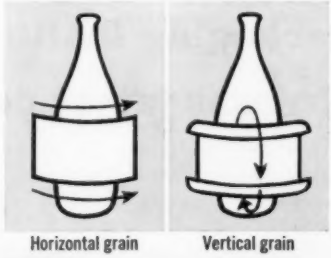
To be basic, labels are generally ordered in pound stock – a phrase referring to the weight of 500 sheets – 25" x 38". Most labeling machine manufacturers specify a 50 to 60 pound (coated one side) lithograph stock as being best for the most successful application of paper labels to glass containers. Actually the paper should be .003" thick for optimum performance.

MOISTURE

C.I.S. or "coated, one side" means a good surface for printing and because the adhesive side is not coated – a good side for adhesive absorption. When an adhesive is applied to the back of the label, moisture is introduced into the paper. Unless the paper absorbs the moisture evenly – wrinkling or blistering will occur. Many times the glue, glass or machine receive the blame for poor labeling, when actually the paper stock is the culprit. *Remember* – if you cannot apply a label by hand without wrinkles or blisters – your problem lies not in the machine but somewhere else. Sounds simple, but many dollars are spent having a machinery Service Engineer come in to point out this fact.

CURLING

Now, even with ideal paper stock and thickness, good judgement is still all important. A label that is heavily inked, calendered or varnished may be troublesome. These features introduce a tendency for the label to curl too rapidly when moisture is introduced thru the adhesive. Varnish may cause the ends to curl away from the glass – a heavy deposit of ink may prevent the moisture from being absorbed causing an uneven drying of the label and wrinkling – calendering affects both sides of the paper stock so that the uncoated side is almost like a glass surface; again poor absorption and wrinkling.



Horizontal grain Vertical grain

GRAIN

The label grain should usually be horizontal – parallel to the printing or to the base of the glass container or in the direction of label wrap. A very simple means of determining the direction of the grain is to moisten the entire back surface with water and permit it to curl. If the curl is from top to bottom towards the center (parallel to the printing) the label is vertically grained. The goal is to have the label grain assist the labeling application which it will do when it's horizontal. If the grain is vertical, the label will try to lift off the glass container and cause undue trouble on the production line.

Labels should always be designed to fit the glass container and care must be taken not to extend over a compound surface.

There are not many rules to follow to obtain quality performance from your Labeler but one thing is certain, a violation of just one good principle can be disastrous. Good judgement always pays dividends!

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Rapid-fire developments and constant changes in packaging materials, machinery, methods, and operation demand that professional packaging people keep abreast of their fields: This was the theme underlying every session of Packaging Institute's 19th annual forum. Highlights presented on these pages bear out this theme.

Packaging Institute forum stresses latest developments

A panoramic review of current developments in many packaging materials, a close look at significant techniques on the production line, an enumeration of significant packaging management methods, and discussions of packaging material applications — all these were features of Packaging Institute's 19th annual forum held recently in New York. Sharply pinpointed presentations and broad-gauge discussions alike emphasized a common theme: The overriding importance of today's packaging experts keeping abreast of their fields. Speakers reminded their audiences that new packaging men enter the field with ever-increasing educational backgrounds and stressed the importance of those already in packaging keeping their own education current.

Several sessions, including one on research and development stressed new materials and applications. Discussing the future of aluminum as a can material, Charles R. Nash, Aluminium Limited Sales, Inc., told his audience that the future of the light metal in canning depends on the speed with which the aluminum industry can improve the art of sheet rolling and, consequently, lower the cost of sheet and slugs from which can bodies are made. While he conceded that general acceptance of aluminum cans may take some time, Mr. Nash also noted that in the smaller cans in special packs there is "a good place" for aluminum to gain wide acceptance in the near future.

Describing the Thermo-Stik process for providing tightly sealed cartons at production speeds, W. Taylor Bouchelle, The Baltimore Press, suggested it as a means of eliminating the bag inside a carton and said its strengthening effect may reduce board caliper in many instances. He described Thermo-Stik as a wax-free, solid plastic, non-toxic material which holds within a range from —35° to 130° F. He suggested a typical operating speed of 250 a minute, making use of 5-inch packages.

Discussing hot melt adhesives for carton sealing, Sydney R. Phin, Package Forming Machinery Co., Ltd., suggested a vinyl-coated board for such purpose. He added that as little as ½ mil each side was sufficient to effect a seal and to protect the carton stock from wet product. He suggested attention to the use of spot-printing the adhesives on cartons — printed in the same way as foil is done.

More New Materials

A new film that permits the use of uncoated and unperforated paper boards for skin packaging was discussed by Benjamin Lechner, Print-A-Tube Company. Noting that conventional films would not seal directly to plain paper boards, thus requiring coatings and perforations, Mr. Lechner suggested the use of P.O.M.V., a combination of polyethylene and a specially-treated "Mylar" polyester film. He said that the mechanical characteristics of P.O.M.V. permit the speeding up of the cycle of packaging and that the strength of the polyester film allows its use in very thin gauges.

Weight reduction for glass containers and transparent spray coatings help preserve the original high strength of glass, Harold L. Eastman, Anchor Hocking Glass Corp., told his audience. Noting that weight reductions around ten per cent or more are common, he urged more attention to these methods of light-weighting glass containers and using coatings to reduce friction between containers on filling lines.

Fiberglas textile products to reinforce paper, tape, or bags afford high tensile strength, permit thinner materials, and offer resistance to temperature extremes, according to William J. Clark, Owens-Corning Fiberglas Corp. He noted that tapes, for example, can provide greater strength with less thickness — one thickness of Fiberglas-reinforced tape being equal to a triple thickness of ordinary tape for carton corner reinforcement and similar applications.

Enumerating the packaging applications of Genetron plastic film and tubing, Robert Kurtz, Unette Corp.,

told his audience this thermo-plastic is brilliantly transparent, impervious, non-toxic, and can be sterilized by autoclave. He suggested its application for the packaging of pre-measured dosages of pharmaceutical products. He urged consideration of its use in package engineering in areas where ordinary materials fall short and predicted its increasing application in unit packaging. He said that it has "excellent" abrasion resistance and has a working range of from —200° to 175° C.

Reviewing the application of KEL-F plastics for such packaging usage as sterilizable tubes, films, and moldings, Dr. H. S. Kaufman, Minnesota Mining & Manufacturing Co., said the material is sterilizable by steam or radiation, is heat-sealable by thermal impulse or electronic sealing, is optically clear, flexible and tough, has virtually zero alcohol, water, and oxygen permeability, and may be ink-marked or hot-stamped for identification. He predicted the use of this material for pouches and as films and liners.

Three major awards

Karl E. Prindle, Dobeckmun Company, Cleveland, received the first professional award of Packaging Institute "in recognition of his pioneer work in flexible films and his outstanding contributions to the field of packaging technology." In addition to his personal and technical contributions to packaging, Mr. Prindle was also cited for his guidance and direction of younger men attracted to packaging.

Phillip Morris, Inc., received P.I.'s first corporate award, given "in recognition of an outstanding advance in applied packaging technology" as a company which has "commercially integrated packaging materials, equipment, and methods in the packaging of its produce."

Leonard J. Wood, National Starch Products, Inc., won the 1957 TOC (Technical Operations Committee) award of Packaging Institute for his contribution of "the most informative paper of greatest technical value at the annual forum." His paper discussed functional coatings and adhesives for use with bleached board.

Package Development

Those attending P. I.'s 19th annual forum also heard quite a bit about the importance of package development and the organization of the packaging function — and received from various speakers some interesting challenges for the future. "It is later than you think," L. H. Zahn, Ciba Pharmaceutical Products, Inc., told his audience. "Time is no longer the major ingredient of progress," he asserted. Noting that the packaging field has accepted new materials slowly, he declared that improvements must come much faster in the future. Relating the current developments in missiles and space travel to problems of packaging, he warned

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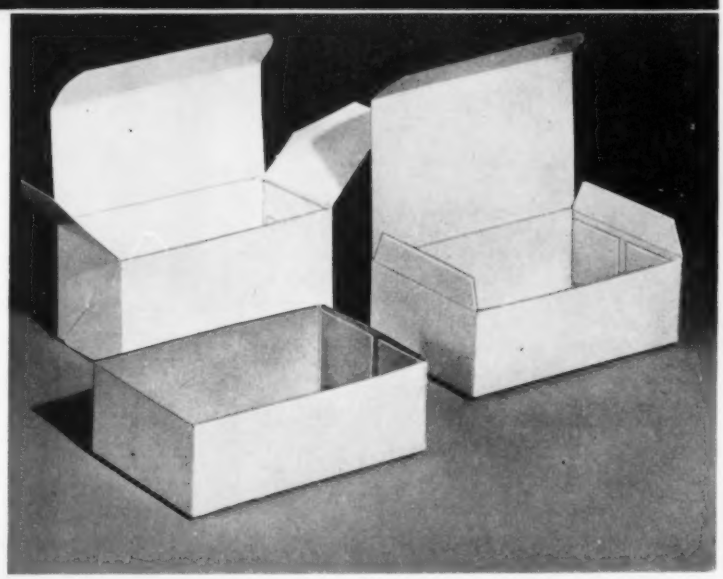

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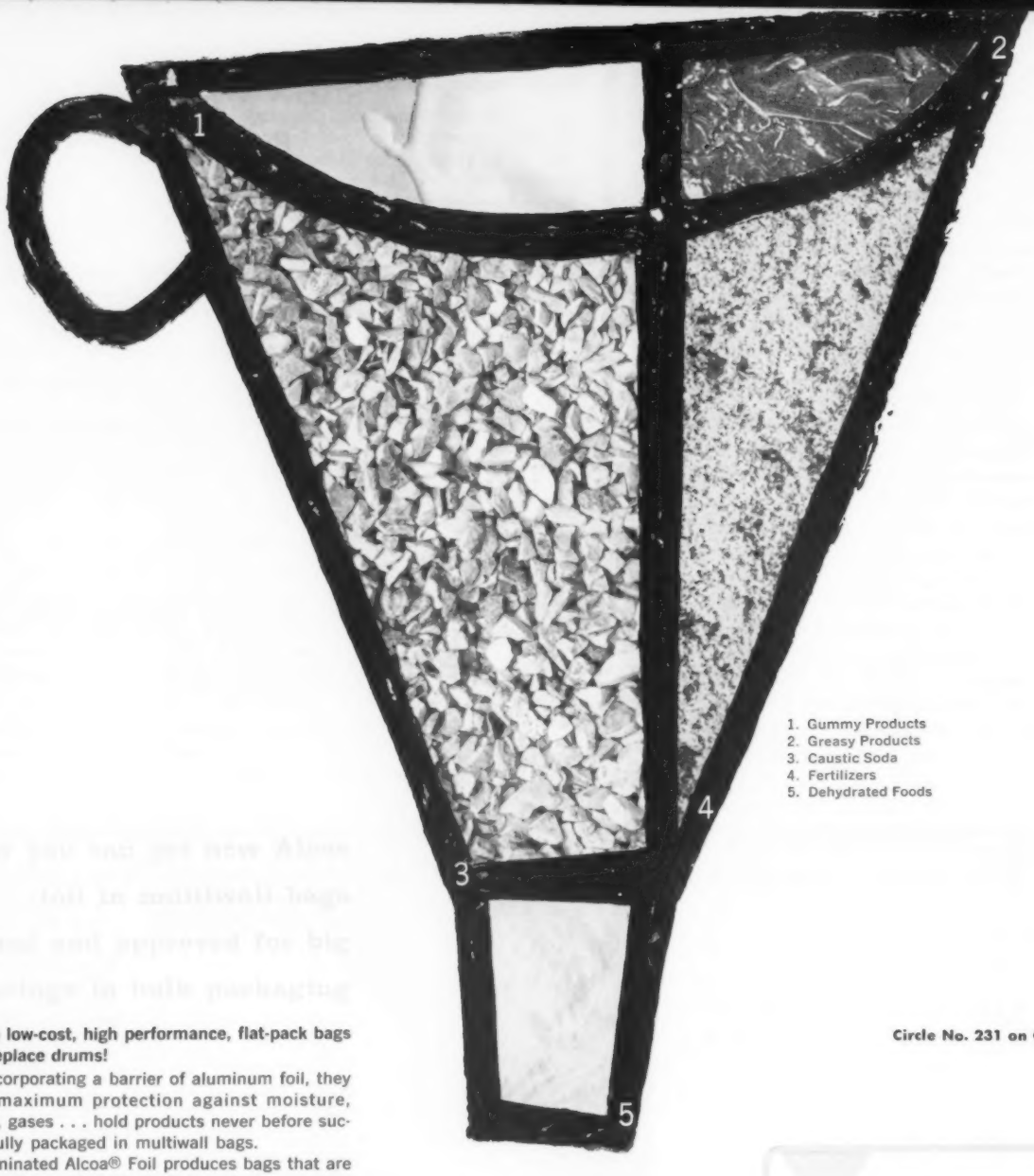

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his audience that packaging people must think "fantastically, creatively, in the future."

Observing that so many of today's developments seemed either ridiculous or the product of a fiction writer's mind, Mr. Zahn urged those attending the forum to open their minds to new concepts and to a constantly increasing rate of technological development.

Also in the course of the forum, three specialists discussed some of the basic requirements of package development and stressed the structural and functional organization necessary for such work. G. J. Schleck, Merck and Co., Inc., outlined ten points of significance in package development.
These include:

(1) Materials: This subject is fundamental. (2) Know the product; ask yourself: What are we trying to package? (3) How is the product to be used? This determines the special features of a package. (4) Containers available. (5) In-plant equipment, facilities, methods, including production and engineering. (6) Quality control. (7) Handling, transportation, protective features, breakage, warehousing, and shipping. (8) Consumer appeal. (9) Laws and regulations, patent requirements and the like. (10) Costs and accounting factors including labor, material, and overhead.

See What You Need

"All this is a depth analysis," Mr. Schleck told his audience. "It is not a check list," he asserted. Rather, he urged his listeners to review these points in terms of their own organization in order to tailor their requirements to a particular company. He said, "It is necessary to integrate all of these and to adapt a given organization to one's needs." He suggested analyzing the degree of importance of each of the ten elements in terms of company products and market, company philosophy and goals, stature and ability of personnel, and strength and ability of the other sections or departments of the company.

"In doing this, it is easy to see what you have, see what you need, and determine how much activity is necessary. In other words, the program is geared to particular needs and is tailored to fit your company and its goals," Mr. Schleck emphasized.

Reviewing his company's organization for packaging development, R. E. Belliveau, The Procter & Gamble Co., asserted that the goal to shoot for is a package meeting the requirements of sales and one consistent with technical and factory requirements for packaging. He stressed the importance of first agreeing on broad objectives and second, working with suppliers to develop the proper packaging materials.

Members of the package development department are primarily technical specialists in packages and packaging materials. At the same time, they work side by side with product development people and work closely with packaging materials suppliers. A feature of their organization is that package development responsibility is delegated on a brand basis. Each packaging engineer is responsible for a group of related brands and has individual responsibility for these brands. Stressing the importance of having specific packaging requirements established, he urged the use of such targets as two years' shelf life or some similar goal.

Emphasizing development of a proper relationship between user and supplier, he pointed out that his company pays suppliers for their research and development work above their normal expenses. Procter & Gamble manufactures no packaging materials and depends on its suppliers to do so. Similarly it is necessary to have established factory standards for use in maintaining the company's own in-plant packaging lines.

What It Takes

The packaging executive needs a fertile imagination, an ability to tear his own ideas apart, the courage to propose innovations, and must be a realist, H. Earl Nack, packaging consultant, told his audience. He reminded his listeners that package development represents an over-all

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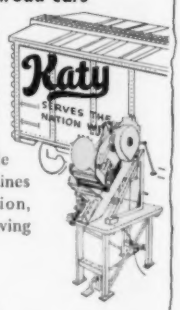
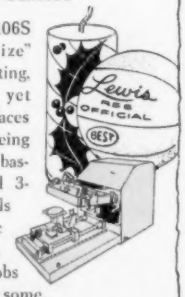


Several leading U. S. toy makers had used decals (costly both to buy and apply) on their replica model train cars. Authentic imprints are now made by Markem 25A machines—speeding production, lowering costs, improving looks.

imprinting food container lids

Bothered by the cost, delivery and inventory problems caused by short run lid printing jobs done "outside", a food retailer now prints the lids he needs *as* he needs them, using several 45ABE machines. Supply now matches demand, with the right marking method.

screen process printing: basketballs . . . to candles



Markem 90S and 106S machines "mechanize" screen process printing, giving fine detail yet heavy coverage. Surfaces and shapes now being marked range from basketballs, candles and 3-color instrument dials to play shoes, plastic bottles and billfolds. Excellent for many jobs—the *only* method for some.

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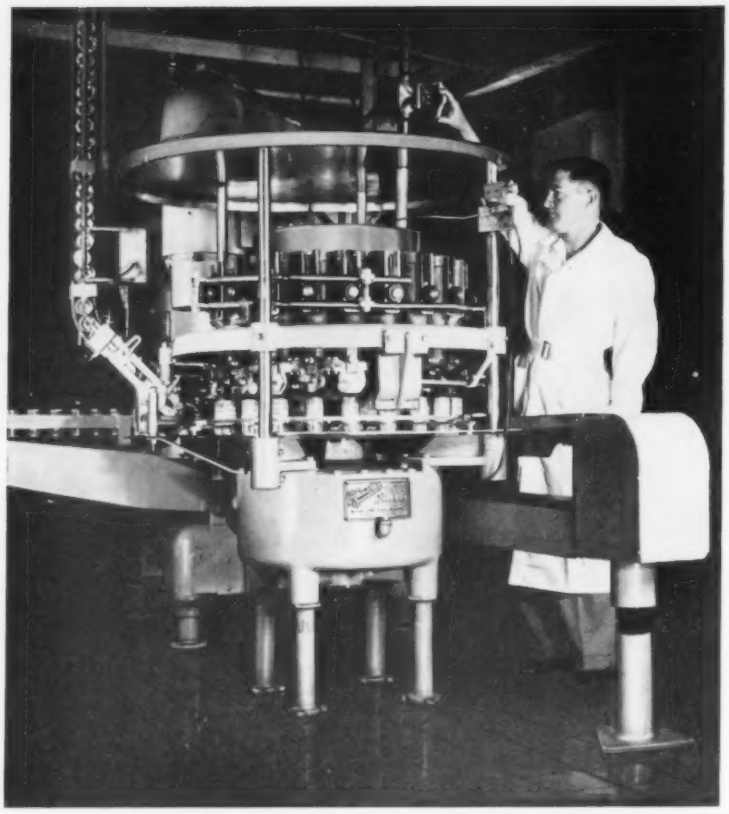

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company activity that is not the work of just one department. As an aid to attaining coordination between the different departments and areas of the company, Mr. Nack suggested the use of definite forms by the package development department.

He urged the use of four records or forms of this type: A material or purchase description; a package specification; a package approval form; and a discontinuance notice. These comprise a permanent record of all activities and decisions, according to Mr. Nack. Further, he noted, they may prove valuable in establishing prior art in the event of legal entanglement. In using a packaging committee, he urged its being limited to top bracket men in order to make decisions. It is important to limit the membership in order to get decisive action without delay, Mr. Nack asserted.

An important feature of packaging management is knowing where to get information — for example, from the government. Charles E. Lewis, U. S. Department of Commerce, told his audience: "It helps to know where to look." Noting that the Federal government is the major source of marketing information and observing that the future increase of population, as well as of gross national product, will make heavy demands on packaging people, he urged his audience to take advantage of the government facilities for furnishing information. Mr. Lewis suggested in particular that packaging and management people contemplating a search for information available from the government should first examine the U. S. Government Organizational Manual (available from the Superintendent of Documents in Washington) and the material on statistical services of the government, available from the Office of Statistical Standards. He suggested to those attending the P. I. forum that careful planning and focusing of the hunt for information available from federal sources would pay dividends in time and effort saved.

Production Line Problems

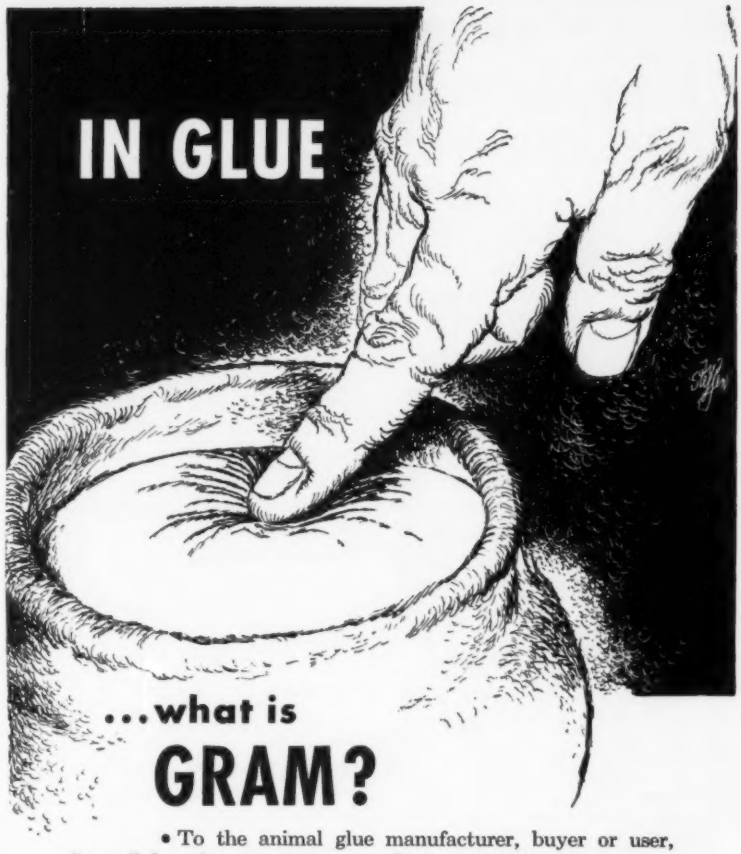
Turning to problems of the pro-

duction line, the advantages of package and equipment standardization came in for discussion: Thomas M. Glynn, John H. Breck, Inc., said that constantly narrowing specifications have established as a goal the use of precisely standard materials. Unfortunately, he noted, standardization and simplification are not too well understood by creative people. As a result many different packages appear and it becomes increasingly important to get the most from standardization of packages. This is particularly important in regard to packaging line operations. When establishing a new package, it is necessary to retain as many as possible of the existing e'e-ments, Mr. Glynn said. He noted in this connection the large investment often involved in change parts for a machine.

Citing the advantages of standardization and simplification, he noted the appearance of better materials and an improved flow of packaging materials, and the need of fewer people for the inspection of incoming items. At the same time, he suggested a pitfall: Do not standardize on the wrong piece of equipment. Similarly, he asserted that being able to standardize on machinery means the elimination of lost time in starting up a new line, less change-over time, better lubrication, and improved maintenance. "Plant personnel have an obligation to continually apply standardization to new and existing packages," Mr. Glynn concluded.

Discussing the importance of effective scheduling and the movements of materials, James T. Rutherford, Ford Motor Company, directed the attention of his audience to the trend to a new type of manager — the professional manager, as distinguished from a production man. Noting that these professional managers are likely to have financial backgrounds and viewpoints, Mr. Rutherford pointed out their keen interest in cost reduction. He urged that packaging specialists constantly look for areas in which to cut costs. In this connection he recommended development of proper storage and planning methods.

Discussing the large scale production and packaging operations in-



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herent in the automotive industry, he recommended use of "air rights" for storing materials — all the way up to the ceiling. He also urged attention to both reserve and line feed storage requirements. At the same time, Mr. Rutherford emphasized the need of flexibility to avoid the costs of having to tear down equipment to meet changes. Before installing such fixed equipment as heavy-duty conveyors, a user should consider the high cost of having to tear up such an installation should packaging and production line changes become necessary.

In connection with the over-all management of such functions as packaging, he stressed the importance of adequate specifications and written details. He emphasized the necessity of pre-planning standardization and flexibility.

Standard Machinery

Discussing the problems of packaging machinery in terms of price, quality, and service, Richard Wellbrock, New Jersey Machine Corp., summarized basic difficulties of the packaging machinery field. He pointed out three areas that present special difficulties. These are requirements of highly specialized talent for machine design, the problem of communicating ideas by means of drawings and the like, and the difficulty of making metal parts on heavy-duty equipment.

Standardization leads to better quality and better service with increased availability of replacement parts, Mr. Wellbrock said. At the same time, he noted the packaging field presents many unanswered questions such as the standardizing of conveyor table heights. Another question is this: Which way is the right direction of flow? As a rule, the machine is built so that work goes only from left to right or from right to left — and it is prohibitively expensive to build a machine sufficiently interchangeable to work both ways.

Another problem is that of painting machinery a special color, Mr. Wellbrock explained. He wondered how many users realize that parts have to be painted at various stages of the manufacturing cycle prior to assembly of the machine. As a result, when a customer desires a machine painted a particular color, it must be disassembled, painted, reassembled, and then re-tested — all of which involves considerable extra cost. "When you buy a standardized machine, you are also buying the painting of it at a certain time within the cycle," Mr. Wellbrock emphasized.

Similarly, special order instructions in regard to motors and controls take the standard machine out of the standard class. He reminded his audience that machines are built in advance, using the parts selected by the machinery manufacturer. "We inventory the motors, controls, switches, and other parts for you," he said, noting that the user of standard machinery does not have to carry supplies of such parts.

Many questions are not susceptible to ready answers, he commented, such as, who is responsible for installing the machines of various machinery manufacturers? Isn't this a user responsibility? Does the machinery manufacturer guarantee per-

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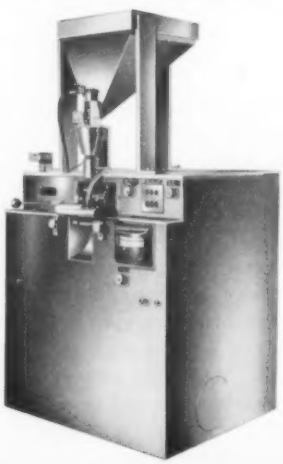

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formance? It would seem the user has at least equal responsibility with the manufacturer in this regard, Mr. Wellbrock remarked, noting that the machine is sold on a production basis.

In seeking an answer to the difficult question of a new or special machine, he urged his audience to consider the desirability of an engineering survey on a fee basis. Spending $2,000, for example, might result in learning that the anticipated machine simply could not be developed or that there would be less need for a special machine than earlier was thought to be the case. Such studies might prove the way out of the dilemma of the high cost of developing special machinery.

Bleached Board Usage

A major feature of this year's Packaging Institute forum was a thorough review of various aspects of bleached board. Noting that bleached liner board for shipping containers is coming of age, William T. Nye, Gaylord Container Corp., Division of Crown Zellerbach Corp., told his audience that brightness and whiteness measuring techniques are being developed so that accurate specifications are now possible for bleached container board. He predicted that probably no single material in the container industry has a greater projected growth potential than bleached materials for shipping container facings.

V. V. Vallandigham, Potlatch Forests, Inc., predicted that by 1975 the use of bleached board will increase by 100 per cent. He urged that manufacturers, ink suppliers, converters, and users all work together to improve the development and enhancement of such board. He said that a mill must know the end use of the board, such as for waxed applications, printing, or what. In connection with printing, the mill should know the type to be used so that it can provide a proper surface. He reminded his audience that attention to bleached board details goes all the way back to the wood, water, and chemicals used in the process of developing the bleached board.

Reviewing problems of the printing and converting of bleached board, William C. Hasselo, Container Corporation of America, noted that printing is improved by the use of denser board. Special attention to score checking, cracking, and warping is necessary. He pointed out that dust was another problem in converting, and that it can be minimized by the use of sharp cutters. He also suggested using brushes, vacuum, and air to remove dust. Further, he reminded his audience to be alert to problems such as printing variations caused by differences of board surface.

Functional Coatings

Functional coatings and adhesives on bleached board came in for discussion from L. J. Wood, Jr., National Starch Products, Inc. Noting the increased demands on the protective or functional properties of the packaging material, he pointed out that this challenge is being met by producing on machine functional coatings of bleached board possessing enhanced properties of grease resistance, stain resistance, and water resistance, as well as improved decorative and printing properties.

Noting that the properties producing good functional coatings are the same properties that make difficult the use of low cost adhesives, Mr. Wood pointed out that the production of improved hold-out surfaces tends to alter the adhesion characteristics of the board. This, he said, places special emphasis on the proper coating formulation so that board can be produced with good functional properties without offering major adhesion problems. He pointed out that functional coatings can "tremendously reduce" or in some instances eliminate the use of costly conversion coating resins. At the same time he noted that further improvements are necessary in size press coated board to make it suitable for many of its potential uses.

(Note: Mr. Wood's paper won the 1957 TOC award for the most informative paper of greatest technical value presented at this annual forum.)

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Not only topics of technical packaging, but also such over-all management subjects as "brainstorming for profit" came in for scrutiny by those attending the 12th annual exposition, short course, and packaging competition of the Society of Industrial Packaging and Materials Handling Engineers. Such topics as "persuasive communication" and "increasing the effectiveness of people" competed closely with packaging subjects for the attention of participants. These pages review the high spots of SIPMHE'S short course.

SIPMHE short course stresses packaging, professional responsibilities

Practical approaches to technical problems and broad preparation for management responsibilities held the attention of those attending the annual SIPMHE short course, conducted by the Society with the assistance and cooperation of Temple University. Because of the newness of the field of package engineering, a lot of self-education is necessary, according to Charles J. Zusi, packaging consultant. At the same time, he reminded his audience that many institutions offer specific education for those who have full-time jobs in the field.

Reviewing the technique of package engineering, Mr. Zusi stressed the importance of sound preparation of package design and cooperative work with almost all of the departments in a manufacturing plant. As a result, the packaging engineer's work is partly managerial in character. He urged attention to careful methods of procedure such as defining a problem, developing or selecting a package to fit the conditions, giving it a thorough preliminary trial (which might include laboratory testing and full-scale shipments), and ultimate crystallization of the resulting package in a specification.

In seeking to reduce the costs of the industrial type of packaging, it is necessary to develop definite procedures, R. F. Uncles told those attending the short course. He stressed the necessity of gathering all pertinent facts, of recognizing the relationships between a packaging function and other areas of operation, of knowing good sources of ideas and information, and how to make use of them. He urged caution in considering cost reduction as a case history approach, pointing out that any such approach must be specific and restrictive.

Electronics and their packaging aspects present many problems of current interest to packaging engineers, according to W. R. MacKinnon, Hughes Aircraft Co. A major phase of the difficulty is that shock can appreciably change the electrical value of many electronic components. Further, this can happen to a degree as to render these parts unreliable or inoperable, Mr. MacKinnon noted. Some tubes and crystals are so delicate that, as yet, no suitable way has been found to package and ship them.

He urged packaging engineers to consider three important steps in their approach to the solving of these problems. Emphasizing first, proper protection of the fabricated item, he cautioned his audience to provide particularly careful in-plant transportation and movement — with particular emphasis on protecting the item from dirt, dust, and moisture, as well as to protect its fixed configuration. In a particular case he used a target board to maintain configuration and a heat-sealed polyethylene bag to protect against dirt, dust, and moisture.

A second factor he stressed is the difficulty of purchased material arriving from vendors in damaged condition. A way to overcome this was the use of a packaging requirement attachment going out as part of the purchase order. It specifically spells out the details of packaging for a particular item and becomes a part of the purchase order. Mr. MacKinnon noted that this insures purchased parts a better chance of intact arrival.

The third important factor involves the shipment of spares. He said that packaging methods are worked out in detail from set specifications and a particular method is detailed for each part.

Even so, he reminded his audience that the packaging of delicate items such as for aircraft and military use is not particularly different from the packaging of various commercial items. He pointed out that even the most complex and delicate electronic components consist of an arrangement of everyday materials, bits of metal, glass, wire, plastics, rubber, and cloth, in such a way as to achieve certain electrical results.

As a result, standard cushioning

materials, as well as corrugated boxes, nailed wood, and cleated panel boxes are proving effective packaging media. He predicted major improvement of these during the next few years, noting, for example, that in the area of cushioning, the electronic field is one of the largest users of hair latex. At the same time, in Mr. MacKinnon's opinion, the cost of molded or cut and laminated hair is an excellent incentive for motivating the plastics industry to produce inexpensive foamed-in-place cushioning material.

"Why not develop along with this some cleatless panel boxes of synthetic materials, rigid, light, sturdy, and easily assembled without nails? Why not have fibre drums of moisture barrier material and metallic sturdiness? Why not a few all-purpose protective papers instead of the multitude in existence? Why shouldn't cushioning materials and shipping containers be broad enough in their scope of application so that each user is not required to have a staff of shock, vibration, and packaging engineers on hand to calculate and estimate proper call-outs?"

Posing these queries to his audience, Mr. MacKinnon concluded by noting that they are looking for packaging advancements that will make the Method II dehumidified pack an absurdity in the near future. "We cannot permit our present preservation and packaging materials and processes to lull us into a sense of adequacy. The field is wide open, the challenge unprecedented, and the rewards more profitable than at any time in our history," Mr. MacKinnon observed.

Organization for packaging development also received attention by those attending the short course. Harper R. Welton, Northrup Aircraft, Inc., reviewed the organization responsibilities of his packaging engineering section. Noting that it is comprised of 25 packaging engineers and technicians, he told his audience these are divided into five groups: Design development; production packaging; Hawk packaging; preservation and liasion; and special projects.

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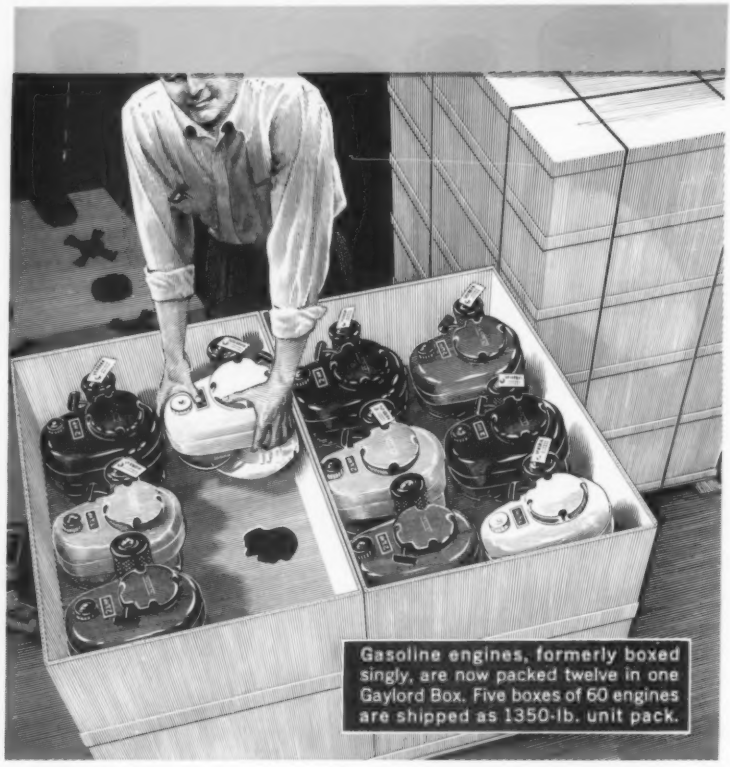
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These units have functional responsibilities. For example, the design development group is concerned with cushioning development and shock vibration studies. It reviews the design and testing of major and item containers of various materials. It also is responsible for the design of containers for all items requiring shock protection of 15 G or less. Similar specialization exists in the preservation and liasion group, to take another example. Located in the shipping area, it provides direct support to shipping in quality control. It establishes cleaning, preservation, and packaging of all equipment shipped and interprets container drawings. It prepares the Air Force packaging team cards, which are the heart of an Air Force packaging program. On one weapon system alone, approximately 27,000 cards are in use. In other words, the group is packaging 27,000 different items for that system.

Emphasizing that the reliability of a weapons system greatly depends on its handling in transportation, Mr. Welton noted that considerable effort goes into properly designing containers to protect against corrosion, shock, and vibration. "It is imperative to consider handling, shipping, and storage problems early in the concept-forming period of future weapons system," he noted. Predicting that in many future weapons systems the accent will be on mobility with delivery of all sizes of equipment dropped by parachute from airplane or missile, Mr. Welton pointed out that the presence of overly-fragile items in a weapons system is somewhat of a handicap on the entire system. This greatly increases packaging and handling costs and problems, he observed. These are illustrative of the problems currently facing packaging engineers in the aircraft field.

Considerable attention goes into the dynamic testing of cushioning materials, since proper design of cushioning can drastically reduce container size, weight, and cost, according to Mr. Welton. He described his organization's mechanical suspension system development involving

the testing of a rubber sheer pad suspension system. He pointed out that they must study the dynamic properties of cushioning materials over the temperature range of −80° F. to +160° F. and for selected variations in humidity.

Along with the presentation of highly specific packaging challenges such as those offered by the aircraft industry, those attending the SIP-MHE short course also received several presentations dealing with the broader aspects of packaging management. These included persuasive communications, brainstorming, and ways to increase the effectiveness of people. For example, those attending the communications session found that people in any given situation are as persuasive as they are accurate in "sizing up" that situation. Reviewing a variety of illustrations involving inaccuracy and confusion, they found that such size-ups involved not facts, but a sort of guess, which in turn involves an inferential going beyond that which is observed.

Packagers attending the course learned the distinction between guesses and facts, and gave attention to the distinction between infering, rather than describing: "We should know when we are infering, rather than describing," members of the session concluded. Relating this to persuasion at the work level, the session emphasized three points to consider:

(1) How others react to your words and actions decides your level of effectiveness in your organization; (2) the way you communicate by words and actions depends partly on the way you size-up the situation you are in; (3) poor sizing up is often based on this confusion between facts and guesses. Noting that persuasion at the work level cannot result from such misevaluation as suggested in point 3 above, the group learned that (1) because of this confusion people often go off half-cocked, building up a case that has no merit and (2) because of such confusion, feelings are hurt, worries are multiplied, tempers flare, and serious mistakes can be the cost.

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persuasive communication, Parke G. Burgess, Temple University, offered a final reminder to his audience: "When confronted with a situation, a communication with others, or when ready to launch into your own, perhaps three questions should pop automatically into your mind: (1) Are your facts really 'facts'? — matters you have observed? (2) or are they guesses — did you go beyond observation? (3) if you did, are your guesses good ones — do you have enough to go on? These answer the basic question of 'How do you know?' " Mr. Burgess pointed out further that if the answers to these questions are yes, an individual's communication is more likely to be persuasive and his personal relations more effective.

How To Brainstorm

Staff members of Temple University also conducted a session on brainstorming, emphasizing the importance of a brainstorming group devoted solely to creative thinking. Those leading the discussion stressed that the power of association is two-way: An idea leads to another in the originator and an idea leads to sparking the ideas of others. The short course session learned four ground rules for brainstorming: (1) Free-wheeling is welcomed — the wilder the idea, the better, since it is easier to tame down than to think up; (2) judicial judgement is ruled out — criticism of ideas must be withheld until later; (3) quantity is wanted — the greater the number of ideas, the more the likelihood of finding good ones; (4) combination and improvement are sought — in addition to contributing ideas of their own, members of the brainstorming panel should suggest how proposals by others in the panel could be turned into better ideas or how two or more ideas could be combined.

The session also learned that to conduct brainstorming it is necessary to have a group of five to ten members, preferrably of dissimilar backgrounds. Further, the problem presented must be specific; it must be narrow enough for the group to shoot ideas at a single target. It is

For more information circle No. 241 on Reader Service Card

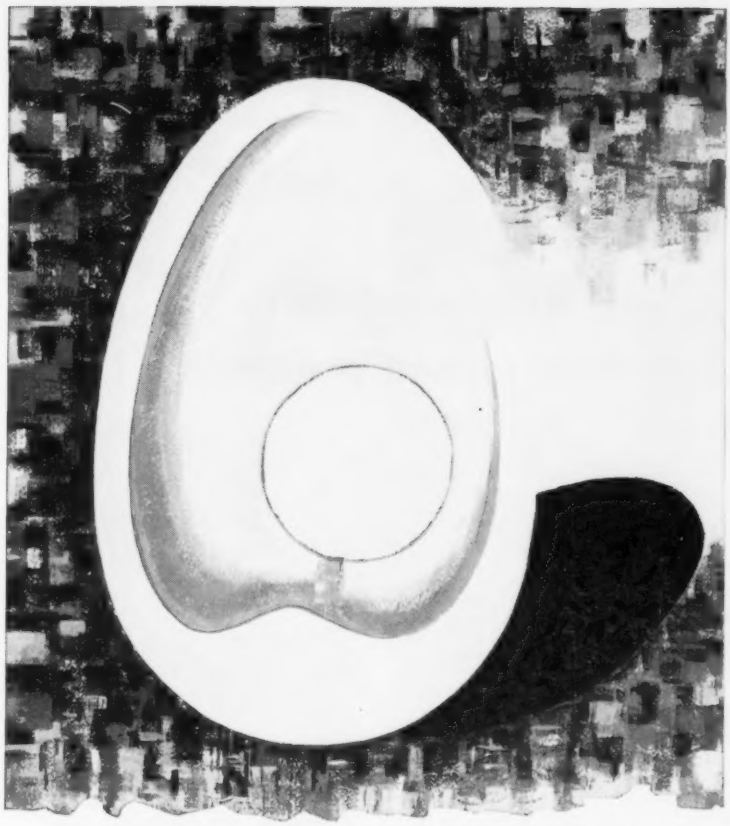
important to avoid industrial concentration problems comparable to writing jingles.

Those attending this SIPMHE session also were warned to appoint a chairman and to select a recording secretary to make a complete transcription of all ideas. Further, they learned the importance of avoiding a perfectionism complex because a group cannot criticize and create at the same time. Typical approaches suggested included adding, multiplying, subtracting, etc. Temple staff members suggested further that the typical approach is to divide, split up, consider piece-meal, or double, have gang work, inject mass production, change sizes, dimensions, etc., in considering typical problems.

H. Paul Abbott, Pennsylvania Salt Mfg. Co., led a session on increasing the effectiveness of people. He stressed the importance of having a personnel climate involving a solid foundation of good principles and a proper management attitude.

He cited four principles for the development of a successful personnel climate. These include: (1) The dignity of the individual — freedom of discussion and absence of paternalism; (2) merit as the prime criterion of progress and reward — considering the proper place of seniority and length of service, absence of nepotism and crown princes, the problem of self-imposed cost of living, and the need for planned appraisal; (3) promotion from within — its impact on employee morale and ideals and principles versus mere ability; (4) security of opportunity — not security in the negative sense, and emphasis on opportunity by plan rather than by chance.

Reviewing the problems of management and the personnel climate, Mr. Abbott stressed three basic considerations: (1) Creative management versus administrative management — noting the different temperament each involves; (2) attitudes towards assets — monetary, mechanical, and human; (3) the evolution of management — personnel administration is in the ascendency.



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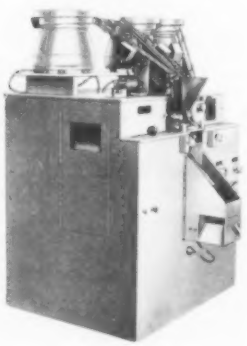
Hardware Packaging

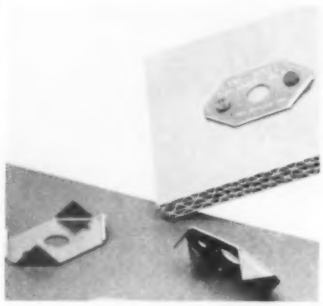
Brown Filling Machine Co. announces the BFM Hardware Formpak, a fully automatic machine for packaging up to four different quantities of four hardware items in a packet formed from a single roll of heat sealable material. Several packeting heads are available: the Vibracount head, designed to eliminate damage to fine finishes; the Delta head, for irregularly shaped hardware items; the Tur-



ret head, for the individual packeting of large hardware items not suited to orientation; and the semi-automatic Vibracount, designed for the feeding and counting of hardware items into preformed packages and capable of handling up to 1,200 pieces/min. Circle No. 1.

Nailing Clips

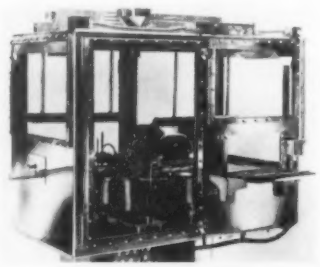
Tri-Wall Containers, Inc., has designed a unique nailing clip which consists of a small rectangle of steel with each of its four corners bent 90° to form triangular prongs that fasten into the surface of triple-wall corrugated board. This nailing clip was designed to overcome the poor nail-holding strength of corrugated and to prevent tearing when fastenings are subjected to lateral stress. When these nailing clips are used, heads of bolts or nails press against the clip in-



stead of the surface of the corrugated. Lateral tearing is restrained by the four corner prongs. Each clip contains two small holes for nails and one larger hole for bolts. Circle No. 2.

Sterile Packaging

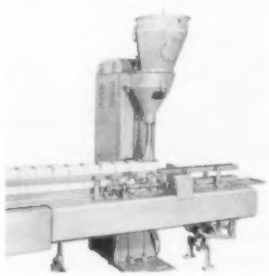
S. Blickman, Inc., announces the development of a line of stainless steel enclosures to provide dust-free, sterile conditions for filling and sealing operations of pharmaceuticals and other sensitive materials. These enclosures can be supplied for any



standard pharmaceutical filling and sealing machine. All joints are crevice-free, flush welded to help maintain sanitary conditions and to facilitate cleaning, Blickman says. Air entering the enclosure through intake baffles at the top first passes through an electronic precipitator with ionizing cell or glass fiber filters and then past a series of u-v lamps for sterilization before being distributed throughout the enclosure. Circle No. 3.

Powder Filling

Triangle Package Machinery Co. announces its Model U-12 Auger Packer, designed to package all kinds of powders and difficult-to-handle products in amounts ranging from one oz. to ten lbs. One feature of this machine is the automatic discharging at timed intervals of the desired amount of product. Speeds up to 30 packages/

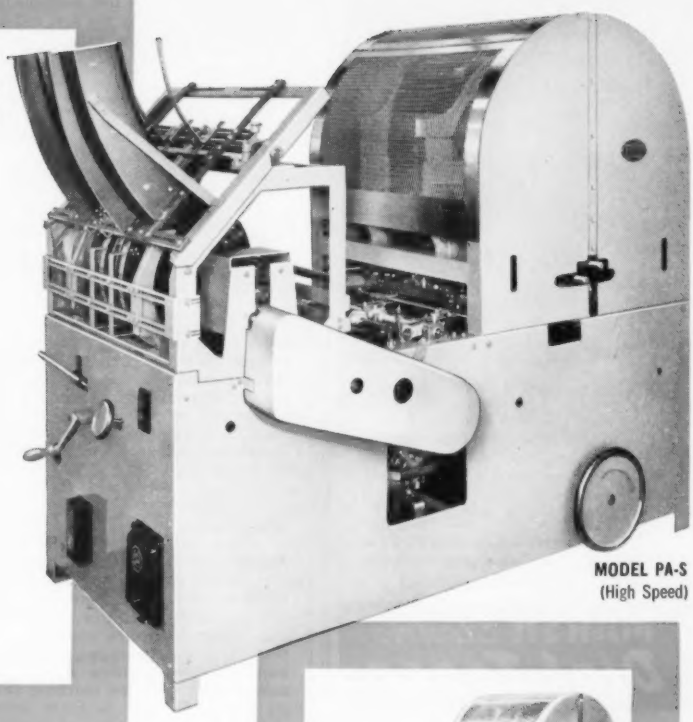


min. are obtainable. When the machine is equipped with an automatic infeed-outfeed package transport conveyor for filling rigid containers, speeds up to 50 packages/min. are obtainable. Almost any style or shape package may be used, and packing pressure is fully adjustable from a loose fill to a hard pack. Circle No. 4.

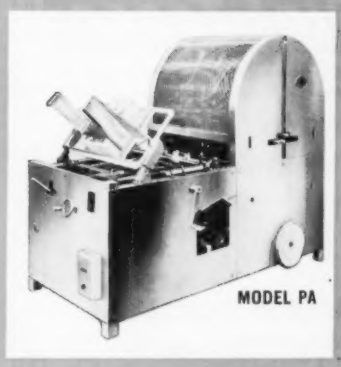
Roll-Over Cleaner

The Filler Machine Co., Inc., has developed a roll-over cleaner that removes glass chips, dust, and dirt from containers by turning them over 180°

CARTON FORMERS BY 'PACKAGE' GIVE YOU Greater Versatility, Higher Speeds



MODEL PA-S
(High Speed)



MODEL PA

To meet today's demands for higher output and more flexibility, Package Machinery offers two continuous motion carton formers. High speed Model PA-S forms up to 210 cartons a minute and Model PA, for larger cartons, operates at 100-a-minute speeds. Both machines, specially designed to give you better cartons at lower costs, offer these advantages:

85% Less Storage Space—You use flat, inexpensive, die-cut blanks only as needed.

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SIZE RANGE			
	Length	Width	Height
Model PA			
Single-end-wall cartons	1⅞" to 13"	1½" to 9⅞"	⅜" to 4½"
Double-end-wall cartons	3½" to 13"	2" to 9⅞"	1" to 4"
Model PA-S			
Single-end-wall cartons	1⅞" to 13"	1" to 9⅞"	½" to 3"

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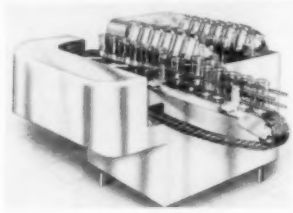
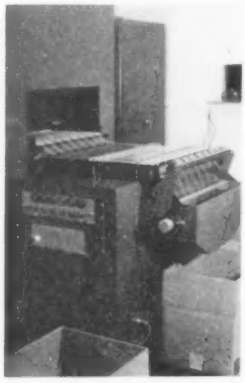
and cleaning by air blast. The unit positions containers into multiple lines prior to inverting by the first roll-over pocket. A vacuum exhaust carries



away foreign matter and cleaned containers are turned upright by the second roll-over pocket to be positioned under filling machine nozzles or on a right angle conveyor belt before moving to the filling operation. Cleaning speeds range from 40 to 200 containers/min. Circle No. 5.

Electronic Counting Machine

Delta Engineering Corp. has a new high-speed electronic counting machine especially useful for bulk packaging operations. Box or bottle indexing conveyors can be combined with this counting machine. The unit automatically positions a new container underneath the batching device



each time the previous filling operation has been completed. It can be constructed with two to ten orientation channels and possible counting speeds range up to 2,000,000 pieces/hour. Circle No. 6.

Medium Run Filler

Hope Machine Co. announces its Type 15 MS 1, a single piston filling machine designed for smaller production runs. This machine features a cross conveyor synchronized with the filling cycle of the single piston unit. Containers moving along the conveyor are stopped directly under the filling nozzle by a special index positioning arm which moves in and out in time with the discharge stroke of the machine. A micrometer type adjustment regulates the amount deposited and the machine can be set to fill quantities from one oz. to one-half gallon at a stroke. Circle No. 7.

Polyethylene Heat Sealer

Globe Heat-Seal Products, Div. of Codie-Kay Co., Inc., has developed the Instant Seal-It. This machine utilizes a timed electrical impulse as a heat source. The application of heat is instantaneous and under exact control, Globe Heat-Seal says. The length of the heat cycle may be varied to permit heat sealing of Saran, Pliofilm, and other films besides polyethylene. Standard models handle closures up to 13" long and special models can be supplied for longer or irregular seals. This machine is compact, weighs 17¾ lbs., and can be plugged into any 110 V AC electrical outlet. Circle No. 8.

Electric Tape Dispenser

Derby Sealers, Inc., has an electrically operated dispenser, the Meto-Electric, which delivers two predetermined lengths of gummed kraft tape

at approximately 210'/min. This new dispenser handles 35 lb. to 90 lb. kraft tape, gummed-in or gummed-out, in widths from 1" to 3" and up to 48" long. The predetermined lengths are set by means of two locking thumb screws and are delivered by tripping the operating lever left or right. The moistening system consists of an enclosed metal tank with a two qt. capacity. The tape is moistened by an adjustable wiper brush as it passes over an aluminum roller. Circle No. 9.

Flow-Pack Containers

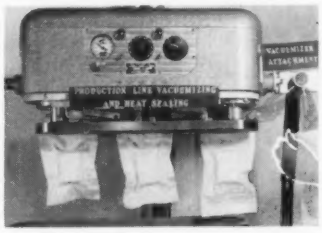
Titan Pallet Co. announces development of the Flow-Pack, a container

designed for the shipment and storage of liquid or granular products. This

internally-braced unit will ship or store from five to 55 gals. weighing up to 500 lbs. Because they come knocked down, the Flow-Pack containers store compactly. The flat top and sides are easily imprinted and the containers are available in a variety of sizes. Circle No. 10.

Vacuumizing Attachment

Ralph Chaffee & Co. has designed a vacuumizing attachment for the Chaffee Rotor-Sealer, US 5 Star Model.



Chaffee says this device makes it possible to vacuumize a package before it is fed into the heat sealing machine, and reduces expenses for this operation. Circle No. 11.

Pressure-Sensitive Tape

Mystik Adhesive Products, Inc., announces the development of Kylon, a plastic film, pressure-sensitive tape. Kylon will adhere to damp surfaces, and it retains its tensile strength after prolonged soaking, Mystik says. Tensile strength is registered as 22 lbs. per inch of width. Kylon maintains optimum adhesion at operating temperatures from 122° to 140° F. and can resist temperatures up to 180° F. The tape is available in ¼" widths and up, in ⅛" increments on 3" cores containing 72 yds. In addition to opaque and transparent, Kylon is available in twelve colors. This tape can be used for sealing, bundling, mending, banding, splicing, fastening, and for printed labels. Circle No. 12.

Linear Polyethylene Sheeting

National Plastic Products Co. has developed a new plastic, Wynene Linear

Polyethylene, a high molecular weight polyethylene sheeting adaptable for vacuum forming. This new material features rigidity in the finished product and resistance to heat and cold. It is available in a variety of colors and is suitable for use as containers, housewares, automotive parts, and packaging. Circle No. 13.

Marking Machines

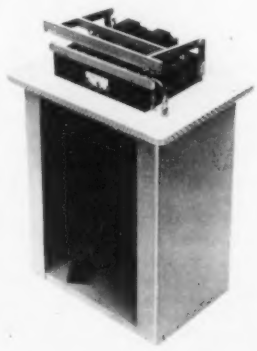
Markem Machine Co. has two heavy-duty machines for marking flat or recessed surfaces. Model 103A, for flat object marking, has large diameter ink rolls and a roll reservoir for better ink film and consistent coverage of the imprint area. Model 103AE features a reciprocating printing head which will imprint recessed areas to a depth of 1¼' below the top surface of the piece. Both models have a maximum imprint size of 9" front to back and 11" left to right. Printing pressure and imprint location are adjustable. Circle No. 14.

Steel Drums

Vulcan Containers, Inc., has expanded its production to include 55-gallon steel drums. A full line of open heads and closed heads, manufactured to comply with Universal Standard dimensions, to meet I.C.C. and Uniform Freight Classification specifications is offered. A variety of types and sizes of openings, fittings, and plugs are available for the different style 55-gallon drums. The open head style is furnished with the lever or bolt locking covers. Vulcan also has a variety of smaller steel shipping pails, ranging in size from one to 15 gal. Circle No. 15.

High Speed Bag Sealer

The Vertrod Corp. has a thermal impulse machine that trims and seals polyethylene bags in one operation. This machine has an automatic scrap blow-off by compressed air, which also powers the jaws in fully automatic or



semi-automatic recycling action. The semi-automatic model is actuated by a foot switch. Both models have cold heater-bars for added safety, and are available in sizes (jaw length) ranging from 14" to 24". These machines can seal over 50 bags/min. and are suited to high-speed bag closing where water-tight seals are not required, such as in the packaging of textiles, hosiery, toys, etc. Circle No. 16.

Frankfurter Wrapping

Wrap-King Corp. announces the development of its Model F wrapping machine designed for the high-speed

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Stainless steel Rex Table-Top chain, available in various widths for single or double lines of cans . . . and the cans are prevented from slipping on the incline and decline by magnets attached to the chain track. The tank itself may be constructed in hot dipped galvanized or stainless steel, and the unit serves as both a heat and leak test tank.

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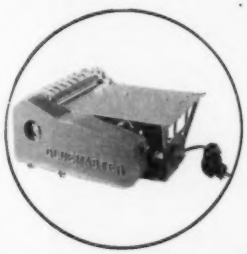

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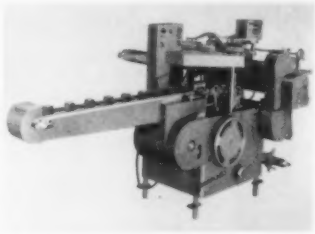
wrapping of frankfurters. Utilizing cellophane, Pliofilm, Polyflex, or Saran, the Model F can package from



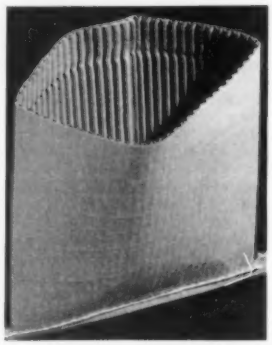
27 to 75 packages/min., depending upon the size of the packages. It handles sizes ranging from approximately 4" to 6¼" in length, 3" to 4½" in width, and ⅝" to 2" in height, wrapping four on four, five on five, or five on four. Circle No. 17.

Aluminum Closures

Aluminum Company of America announces the Flavor-Lok cap, a rustproof, non-toxic aluminum closure. Literally tailor-made for each bottle, the plain-sided skirt of the closure is rolled onto the bottle threads after the container has been filled and capped. Glass for the new cap carries a triple thread, which assures quick removal and replacement, as well as positive sealing, according to Alcoa. Since the cap is not threaded before application, there is no turning of the closure which might cause the glass to score the liner. Cap liner and glass are sealed tightly before threads are formed in the cap skirt. Circle No. 18.

Cushioned Shipping Bags

Sherman Paper Products Corp. announces the availability of its Corro-Bags. These are lightweight bags made from a single-wall corrugated sheet, providing resilient cushioning



on the inside. The bags may be sealed with staples or gummed tape. Double-scored edges dissipate end-blows, Sherman Paper Products says. Corro-Bags are shipped flat, with one end sewn closed in a lock stitch with cotton thread. These bags are available in all standard sizes. Circle No. 19.

Can Printer

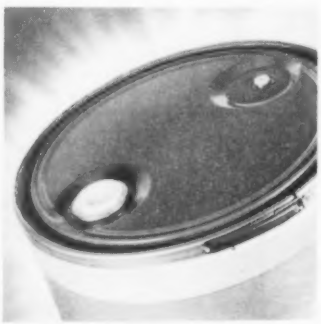
Chapman Chemical Co., Metal Products Div., has developed the Chapco Print-A-Can printer for the imprinting of five-gallon cans. This machine will handle up to 500 cans/hour and requires one operator. The portable Print-A-Can machine accommodates all types of five-gallon cans, including bail and tite-head, with or without rolling hoop. It utilizes rubber printing plates and can print an area 9" x 14". Chapman Chemical also produces the Chapco Print-A-Drum, designed for the printing of 30 and 55-gallon drums. Circle No. 20.

Gross Bagger

Richardson Scale Co. has designed Model GA-17, a belt-fed gross bagger with a completely automatic cut-off. It was developed for use with open mouth textile and multi-wall paper bags, in sizes ranging from ten lb. to 140 lb. capacity. This machine feeds the material from an overhead supply bin directly into the empty bag, and a speed of up to six or more bags/min. can be obtained. The incorporation of the belt feeder permits the handling of a considerably extended range of materials by a gross weigher, Richardson says. Pellets, dairy feeds, meals, mash feeds, chemicals, peanuts, beans, and other materials of similar physical characteristics are handled by this unit. A trigger device automatically stops the feeder and cuts off the scale when the desired weight is reached. Circle No. 21.

Liquid-Tight Fibre Drums

Continental Can Co.'s Fibre Drum and Corrugated Box Div. announces the Liquipak fibre drum, which features a built-in polyethylene lining.



For corrosive products, the top metal chime can be protected with a polyethylene sleeve heat-sealed to the lining. An insulated fibre sidewall for protection against sudden temperature changes is another feature of the Liquipak drums. These drums have a liquid-tight bottom crimp, heavy duty electrogalvanized top and bottom chimes, and are available with either a vinyl or epoxy coated metal cover, with or without bungs and vents. The Leverpak locking device simplifies opening and closing, Continental says. Circle No. 22.

Put longer-lasting "SELL" into your Boxes!

Boxforming by Boxmaster gives your packaging these two big advantages:

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2. Now, *circle* the corresponding numbers on the postcard, located inside back cover.
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Potato Starch Components

Stein Hall & Co., Inc., has published a twelve-page booklet which describes the physical and chemical properties of amylose and amylopectin, the two principal components of potato starch. These separate fractions of starch are available commercially and the booklet tells some of the uses for them and gives information on methods of handling them. Circle No. **101.**

Packaging Check List

National Metal Edge Box Co. offers a packaging check list that covers packaging and its relation to storage problems, inventory control, box assembly, materials handling, packing and shipping, warehousing, and display at point of purchase. The check list can serve as a useful yardstick by which an industrial firm can measure its present packaging program. Circle No. **102.**

Counting and Imprinting Machine

Pitney-Bowes, Inc., has literature which describes in detail its Tickometer machine. This machine counts, dates, codes, or otherwise marks all types of paper and cardboard forms at speeds up to 1,000 pieces per minute. Adjustable controls regulate the automatic feeding and stacking mechanism. The Tickometer has a set-back counter to record partial runs, and a tamper-proof cumulative counter. Circle No. **103.**

Multi-Wall Foil Bags

Reynolds Metals Co. offers a brochure entitled "Multi-Wall Foil Bags," which describes how multi-wall aluminum foil bags are now being used for bulk shipment of such products as hygroscopic or deliquescent materials, moist pastes, corrosive chemicals, oily products, gaseous compounds, caustics, and alkaline products. The foil is laminated either inside, outside, or between the two layers of paper in a two-ply kraft bag, depending upon the requirements of a specific product. Circle No. **104.**

Cellophane Packaging

American Viscose Corp. has a new brochure, "Recommendations for Fresh Produce Packaging." This folder opens into an easily read table which specifies the cellophane types recommended for various product items according to the style of wrap, i.e., direct wrap, tray overwrap, or bag. The folder applies to all three packaging levels — grower, terminal, and retail. Circle No. **105.**

Pressure Sensitive Tape

Tropical Tape Division offers File No. 57TT1, which describes and illustrates the use of pressure sensitive tapes under difficult conditions. These tapes have been tested and used in tropical climates where humidity, heat, mold, and sun exposure have been major destructive factors. The file has the actual tape samples applied, along with certain specifications and applications for them. Circle No. **106.**

Polyethylene Sealing Machines

Carbert Mfg. Co. has a folder that describes its Bank-Seal polyethylene sealing machines. Various models of tube sealers and sealing and filling machines are pictured and their specifications given. Circle No. **107.**

Washing Solution Additive

United Chemical Corp. has a technical bulletin on its product, Extend-R, an additive for caustic bottle washing solutions. Extend-R is an organic sequestering agent with certain wetting, dispersing, and rust solvent properties. The bulletin contains directions on how to use this product. Extend-R was developed for use with commercial flake or liquid caustic in soaker alkali machines. Circle No. **108.**

Paper Container Adhesives

H. B. Fuller Co. has published a booklet on paper container adhesives. This booklet contains sections on adhesive products for folding boxes, set-up boxes, fibre tubes and drums, and glued lap containers. Technical information and specific characteristics of each type of adhesive product are included. Circle No. **109.**

Food Packaging Equipment

J. B. Dove and Sons offers a twelve-page catalog of heat-sealing and other packaging equipment for the food industry. This new catalog shows tables for prepackaging meat, dairy products, produce, and other items. Also featured in the booklet are scale and labeling tables, bag stapling machinery, and heat sealing units. Circle No. **110.**

Waxed Paper Packaging

Waxed Paper Merchandising Council, Inc., offers a reprint of an article, "Waxed Paper — Its Qualities, Uses and Possibilities for More Effective Flexible Packaging." This article, reprinted from the **Paper Yearbook,** provides much information about various types of waxed paper, such as wet waxed, dry waxed, one side waxed, wax laminated, and wax-sized papers, and the uses for each type. Circle No. **111.**

Addressing and Marking Machine

Weber Marking Systems, Div. of Weber Addressing Machine Co., Inc., has issued a four-page bulletin describing its Web-O-Print duplicator. This machine is used to imprint shipping addresses and product information on labels and cartons. A chart lists the eleven different Web-O-Print models with their respective printing dimensions and prices. The folder also includes a check list of other uses for this machine. Illustrations accompany the text. Circle No. **112.**

Polystyrene Packages

The Dow Chemical Co. has released a 24-page "Supplement to a Catalog of Packages." Illustrations and specifications of over 60 different polystyrene container styles are included, as well as the names and addresses of molders producing them. Square, round, rectangular, and irregularly-shaped containers, and vials and tumblers are available. Circle No. **113.**

Transmission Units

Graham Transmissions, Inc., has Bulletin 522, which describes in detail various types of transmission units. The text is accompanied by drawings, graphs, and photographs. A section showing several types of controls for special applications is included in the bulletin, as are nine tables giving specifications for various Graham units. Circle No. **114.**

Filling Machines

Arthur Colton Co. offers a tab-indexed file folder containing individual catalog sheets which give details on high-speed rotary tablet presses, liquid, tube, and hard capsule fillers, power triturate machines, punches and dies, drying ovens, polishing stands, batch mixers, granulators, dust collectors, and bottle conveyors. Photographs and charts accompany the technical material. Circle No. **115.**

Granular Filling Machine

Potter & Johnston Co. offers Bulletin No. 163, describing the operating features and specifications for the Model F Gilda automatic filling machine. This unit fills fibre or metal cans with any

powdery, granular, or dry material at speeds up to 300/min., and measures to plus or minus a fraction of an ounce. The machine accommodates round cans approximately 3" dia. with heights varying from 4¾" to 7". Circle No. **116.**

Photoelectric Probes

Autotron, Inc., offers literature on its photoelectric sensing probes designed to reach inaccessible locations. The photoelectric sensing heads are equipped with light conducting Lucite probes which are attached to a case containing both the phototube and light source lamp. The case may be mounted with the probes extending into inaccessible areas. Probes are available in lengths up to 4', in almost any shape. Circle No. **117.**

Automation

Island Equipment Corp. is offering a folder entitled, "Automation, Its Meaning and Implications." This brochure is of special interest to those concerned with materials handling and automation. Circle No. **118.**

Plastics Molding

Waterbury Companies, Inc., has a brochure which describes its facilities for compression, transfer, and injection plastic molding, and its associated operations of mold making, engineering, design, research, and assembly. Photographs illustrate the text. Circle No. **119.**

Hydraulic Valve Actuator

Askania Regulator Co. Bulletin 38.3 gives details on the Electro Hydraulic Valve Actuator. This new actuator is designed for use with low level ac or dc signals from electronic controllers and measuring elements or remote positioning devices. It can be mounted on valves having ½ to 1½ inch stroke, requiring less than 200 lbs. thrust. Circle No. **120.**

High-Temperature Ovens

American Instrument Co., Inc., offers information on its high-temperature (35° F. above ambient to 750°F.) ovens. Design features of these ovens include horizontal air flow, control dampers to permit option of recirculated or non-recirculated air, an additional breather-damper, a single bar door latch, and front-panel controls. Circle No. **121.**

Textile Wrapping Machines

Battle Creek Packaging Machines offers a data sheet giving technical specifications of three of its wrappers especially suitable for textiles. Floor space required, sizes handled, type of packaging materials handled, speeds per minute, electrical data, etc. are included. Circle No. **122.**

Polyethylene Packaging

The Bakelite Co., Div. of Union Carbide Corp., has a twelve-page booklet which outlines the various methods of packaging meat and poultry in polyethylene film. The booklet enumerates specific instances where meat products were profitably packaged in this material. The text is accompanied by many illustrations. Circle No. **123.**

Weight Measurement, Control

Weighing & Control Components, Inc., has a 20-page bulletin on the weighing of bulk material, entitled "Weight . . . Its Measurement and Control." This bulletin compares batch-in, batch-out, and continuous weighing processes, and explains how a completely automatic weighing system can be assembled by building-block techniques using unitized weighing components. Both pneumatic and electrical weight transmitters are discussed. Drawings and photographs illustrate the bulletin. Circle No. **124.**

Electronic Counting Equipment

Post Machinery Co., Electronics Division, has several catalog sheets which describe various electronic counting machines. These include Model F-2, a direct impulse counter for slower counting; Model PW-5, a five selection preset counter which counts up to 5,000 units/min.; Model LF-1A, a lineal footage counter and readout machine; and Model P3-RM, a counter for cartoning etc. Literature is also available on Model ER-1, an edge register detector designed for more accurate control of materials manufactured in continuous form. Circle No. **125.**

Government Packaging Course

Container Laboratories, Inc., has literature on its five-day training course, The Management Aspects of Government Packaging, held every other week in Washington, D. C. December sessions will begin on December 2 and December 16. The course is designed to promote a comprehensive understanding of the major principles of contractor-government relationships. Container Labs will make special arrangements to conduct this training course on the home ground of companies having a sufficiently large number of employees interested in the subject to warrant such an arrangement. Circle No. **126.**

Piston Filler

Elgin Manufacturing Co. lists the specifications for the Speed-King two-valve filler in a current data sheet. This machine was developed to handle liquid and semi-liquid products and accommodates all sizes of jars or tins from 1 oz. to 1 gal. Filling speeds range from 18 to 126 containers/min., depending upon the product and the container size. Circle No. **127.**

Neck Banding Machine

Gisholt Machine Co. has an illustrated brochure which lists specifications and operating details of the Sealamatic, an automatic cellulose neck band applying machine. This unit handles half pints, pints, fifths, quarts, either flat or round, applying cellulose neck bands to 35 mm. in diameter and 65 mm. in length. Speed range is adjustable from 50 to 150 bottles/min. Floor plan layouts are included. Circle No. **128.**

Polyethylene Bag Making Machines

Simplex Packaging Machinery, Div. of Food Machinery & Chemical Corp., offers Bulletin SPM-8R, which lists specifications and operating details for two models of polyethylene bag making machines. These units handle flat or tube stock, plain or printed stock, light and heavy gauge film, and produce curve-seal bags and flat or gusset bags. Circle No. **129.**

Releasing Agent

Potdevin Machine Co. offers a brochure that describes Release-Cote, an inert releasing agent. It prevents coatings, adhesives, inks, and plastics from adhering to the walls of pots, hoppers, fountains, spray booths, etc. This material can be applied with a rag, brush, or spray equipment and will not mix with coating material. It can be used on the machine's moving parts to act as a shield against splash. Circle No. **130.**

Carton Set-Up Machines

Currie Packing Co. manufactures four models of carton set-up machines which are described in a current illustrated specification sheet. Handling any type lock, strip glue, or corner glue style cartons, these units produce finished cartons within a size range from 4½" long, ¾" wide, ¾" deep up to 11½" long, 10½" wide and 4" deep. Speeds range between 60 to 100 cartons/min. Circle No. **131.**

Corrugated Containers

Inland Container Corp. has a 32-page booklet that contains a good deal of useful facts to consider when purchasing corrugated shipping containers. Discussion on some of the various types of board and corrugations is included, as well as some interesting information on the organization and development of Inland. Circle No. **132.**

Cushioning Material

Jiffy Manufacturing Co. describes Kushion-Kraft, an all purpose packaging material that absorbs shock and protects surfaces and finishes. It consists of plies of processed and rugated papers in either kraft or tissue or a combination of both. Thickness and strength is controlled by the number of plies and type of paper used. 19 different types of this material are available. An information sheet is offered which shows a specifications table listing the weight and thickness of each grade. Circle No. **133.**

Liquid In Corrugated

Stone Container Corp. has a four-page brochure describing its Sana-Flo corrugated container with a plastic inner bag for packaging liquids, semi-liquids, and powders. Illustrations showing how containers are filled, sealed, and opened are included in the brochure, as well as specific performance data from a typical user. Circle No. **134.**

Supermarket Wrapping Machine

Miller Wrapping & Sealing Machine Co. has issued an eight-page catalog on its new Stor-Rap wrapping machines for prepackaging meats, fish, poultry, produce, and bakery goods. Designed for supermarket use, this machine handles tray and board wrapping, and will wrap packages from 3" x 4" to 9" x 12", and up to 4½" in height. Circle No. **135.**

Vertical Piston Fillers

Anderson Bros. Mfg. Co. has a four-page illustrated brochure which describes its filling machines. Three models are available for filling bottles, jars, tubes, and cans with pastes, liquids, semi-liquids, and creams. These machines are available in hand-operated, foot-operated, or air-operated models. Circle No. **136.**

Elevating Equipment

Lynch Robo Corp., Div. of Lynch Corp., offers a new six-page folder which illustrates how its Robo-Lift elevating equipment solves various bulk food handling problems. The folder shows how infeed and discharge arrangements, plus length of travel, may be positioned to integrate with existing plant equipment. Another feature is a chart on which an actual materials handling problem may be diagrammed by the potential user for analysis and recommendations by Lynch engineers. Circle No. **137.**

Checkweighing Machines

Exact Weight Scale Co. has issued data sheet No. 3347 on its Selectrol Automatic checkweighing machines. These models are capable of proving weight accuracy in the range of one part/5,000 to one part/20,000. An automatic transfer mechanism places the commodity on and removes it from the scale with a minimum of impact. Circle No. **138.**

Multiwall Bag Filling

Black Products Co. has a current folder which describes its line of bag packaging equipment. The air-flow valve bag packer will not break down size of particle or flake, and moves material into the bag by air. It will fill bags weighing from ten to 125 lbs. packed. The screw-type packer and settler is for free-flowing dry, granular material. It will fill valve bags weighing from 25 to 125 lbs. packed weight. Circle No. **139.**

Tetra Pak Containers

AB Tetra Pak Co., Inc., has issued an interesting 20-page magazine showing some of the European uses for the Tetra Pak package. Illustrated are packages of ice cream, honey, spinach, juice, etc. Circle No. **140.**

Chemical Specialties group publishes aerosol guide

A new guidebook recently prepared by the Chemical Specialties Manufacturers' Association is available for use by users and suppliers of aerosols and pressurized packages. It consolidates and brings up to date the accepted testing methods, regulations, and recommended practices developed and used by the industry over the past ten years. This book should prove helpful as a basis on which users and suppliers can maintain safe, high quality packages of these types.

A "pre-marketing" check list points out the many factors to be considered in packaging products in pressurized containers. Some of these are: Product formulation and its effect on container and valve mechanism; selection of proper valve to dispense specific products properly; quality of product upon prolonged storage at various temperatures and container positions; flammability hazards, etc. Due to these containers being under pressure, the type size, location, and text of "warning" labels are suggested.

As an aid to development of minimum commercial fills, the guide lists standard sizes of containers manufactured by various companies and recommends them for certain pressurized products. These apply to products having no greater than 20 per cent non-volatile materials in the formulation and which will carry a label contents not under a specified weight. Additions to these recommended sizes will be made occasionally for various types of products. Also, a recommended "safe-fill" is described.

A tentative glossary of terms used in the aerosol industry is shown and is helpful to anyone contemplating going into the production of pressurized products. Also useful to the new filler, as well as to those who currently fill this type of package, is the informal safety manual chapter. It discusses the proper storage and handling of propellents and chemicals, handling of containers and sealing machinery, and other items necessary for safety in this industry. The manual applies to research and experimental work as well as to pressure and refrigeration filling on a production basis.

The guide contains complete methods for all accepted tests developed by the scientific committees of the association's aerosol division. For example, these include flammability and combustibility, liquid densities, internal pressures, seepage rates, delivery rates, solids content, particle size, etc. For glass aerosol products, internal pressure methods and inspection procedures are included. The methods enumerate in detail all equipment required for conducting the tests and include necessary formulas for calculations.

The book contains many halftones, line drawings, graphs, and charts which are helpful in setting up apparatus and following the test procedures. These illustrations also aid in interpreting results. Insecticide manufacturers will be interested in the cockroach and flying insect tests. These methods are unique in that they describe the complete procedure for rearing insects to be used for testing purposes.

The guide represents nearly a year's work in reviewing, editing, and updating published material and is in looseleaf binder form to facilitate future changes. It is available at $8.00 per copy, plus postage, from the Chemical Specialties Manufacturers' Association, Inc., 50 E. 41st Street, New York 17, New York.

Package Engineering names Harry E. Vick Jr., associate editor

Harry E. Vick, Jr., is now associate editor of PACKAGE ENGINEERING and makes his headquarters in our Chicago offices at 185 N. Wabash Ave.

Prior to joining PACKAGE ENGINEERING, Mr. Vick was associated with Kraft Foods Company. He joined that organization in 1946, starting in dehydrated foods research. In 1948 he moved to the Kraft Foods research laboratories, Glenview, Illinois, and became a member of its package research department. His work included the research and development of many types of packaging materials for both existing and new products of the Kraft organization.

He is a graduate of Indiana University with an A.B. degree in chemistry. Following his graduation from college, he was associated with Buckeye Cotton Oil Company, Louisville, a Procter & Gamble subsidiary. He was a chemist in its production control laboratories. Subsequently he joined Joseph E. Seagram & Sons, Inc., Louisville, and worked in its production control laboratories and its production and engineering departments.

Leaving Seagram's in 1943, he was commissioned in the Navy and later served in the Atlantic and Pacific theaters. He is currently a lieutenant commander in the U. S. Naval Reserve.

Thus Mr. Vick brings to this key editorial position a broad background of technical and operational experience in several major areas of packaging. His technical education and experience make him well-qualified to serve the editorial needs of our 35,000 readers. — R.B.H.

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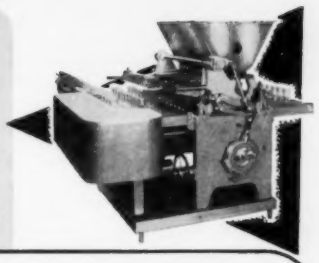

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CLASSIFIED ADVERTISING

Our classified advertising section is intended for use by those wishing to buy or sell used packaging equipment, to employ packaging personnel, seek such employment, offer or seek business opportunities. It is not available for general advertising. Terms: Cash with order. Rates: Up to 60 words, $10.00. If boxed, $20.00. Up to 120 words, $20.00. If boxed, $40.00. Up to 180 words, $30.00. If boxed, $60.00.

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Packaging Director — Experience includes design, direction, materials, methods, specifications, and coordination with marketing, sales, advertising, purchasing, production. Please reply to Box 1201, Package Engineering, 185 N. Wabash Ave., Chicago 1, Illinois.

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For Sale — Packaging machine, Battle Creek Model BT30 and Bond M L Dual Filler. Fills, seals folding boxes, both bottom and top. Continuous flow principle. Quickly convertible. Wide range of boxes up to 10 inches in height, 30-40 per minute. Price new machine $15,120.00; this used one $5000.00. Reply to W. J. Wittekind Company, 1041 Richmond Street, Cincinnati 3, Ohio.

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It is about time we clarify our thinking regarding the profession of packaging. There has been a lot of confusion concerning just what packaging is — whether it is a trade, vocation, or some other kind of activity. Whether or not it is a profession as such at this time is a hard question to answer. But we certainly have clear indications pointing to its coming status as a profession.

As far back as 1912, the late Louis D. Brandeis told a Brown University graduating class that "business" should be one of the professions. He had objected to classifying students according to those who entered the professions and those who entered business. "The once meager list of the learned professions is constantly being enlarged," Mr. Justice Brandeis stated. He urged recognition of such "new" professions as manufacturing, transportation, and finance.

Packaging — a well-defined profession?

Because so many packaging experts have come from the ranks of clearly defined professions such as chemical engineering and the like, there has been a marked hesitance to call packaging itself a profession. Some say it is simply an activity that draws upon or requires the talents of numerous professions, but isn't this true of many established professions? Incidentally, we have many definitions of just what constitutes a profession. These usually include such elements as a substantive body of knowledge, a clearly delineated preparational curriculum, and so on. And probably there is general agreement that a profession includes these three elements: An occupation having preliminary training, intellectual in character — involving knowledge and learning as distinguished from simply skill; (2) an occupation pursued largely for others and not merely for one's self; (3) an occupation in which the amount of financial return is not the accepted measure of success. Mr. Justice Brandeis offered these three standards to the Brown graduates.

In any other words, anyone or any field claiming to be professional places a premium on excellence of performance and service to others. Who can say that a truly professional packaging man does not constantly strive to improve his technical or operational competence? Who would regard packaging as a mere money-getting trade?

Some packaging men are inadequately paid and others are richly rewarded. There are many reasons why some men's salaries have not kept pace with the contributions they are making to their companies. Without enumerating them, it is enough to say that the growing trend toward professional stature is bound to generate a trend toward more truly professional levels of compensation.

Demands made of us: Clearly professional

Probably never before has a packaging expert been more keenly aware of the challenges facing him. We hear that a technical education used to last a man a lifetime, but now runs dry in ten years unless constantly replenished. We also hear that the ever-rising educational standards and attainments of those entering and who will enter the packaging field place a special burden on the people already in it to keep abreast of the times. It is a matter of common knowledge that the *rate* of technological progress will increase rather than decrease.

Perhaps the incredible proliferation of packaging developments and the accompanying demand for intense specialization by individuals go hand in hand in making it difficult for many to think of packaging as a profession. Perhaps if packaging people start thinking in professional terms they will begin to outline for themselves the broad patterns by which they may organize and classify the vast array of substantive knowledge and informed opinion that comprise the know-how and know-why of packaging.

To PI and SIPMHE: Keep up your good work

We congratulate Packaging Institute upon its establishment of a professional membership status. We are keenly aware of its difficulties in deciding who qualifies and who does not qualify as a professional. Since so many of today's leaders of packaging have attained their success the hard way, it is difficult to determine just what is professional status.

Likewise, we are glad to see the Society of Industrial Packaging and Materials Handling Engineers going forward with its efforts to keep membership at a professional level. The problems inherent in defining a packaging engineer prompt us to encourage SIPMHE to keep up its good work in striking out for increasingly higher standards.

We certainly hope that those who can qualify for professional membership in these organizations will take advantage of the opportunity. Whether there is or will be a packaging profession depends on just how effectively our packaging specialists lay the foundation now on which to establish a true profession.

Bruce Holmgren

Editor

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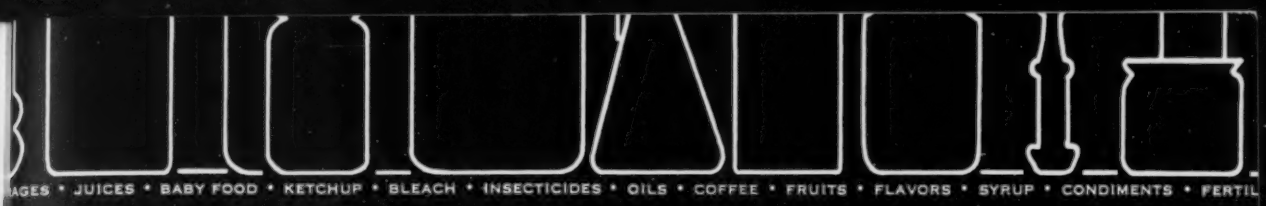

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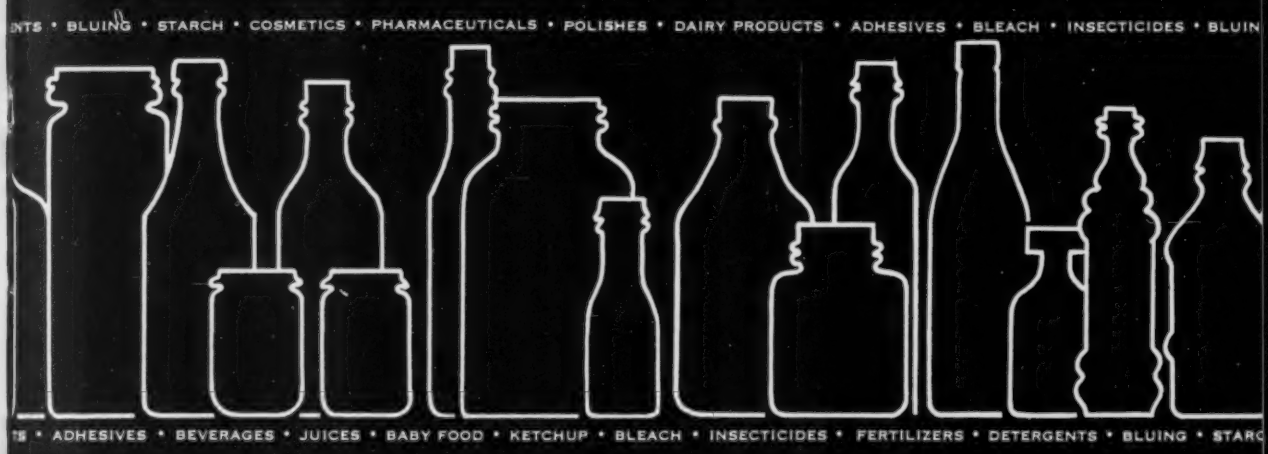
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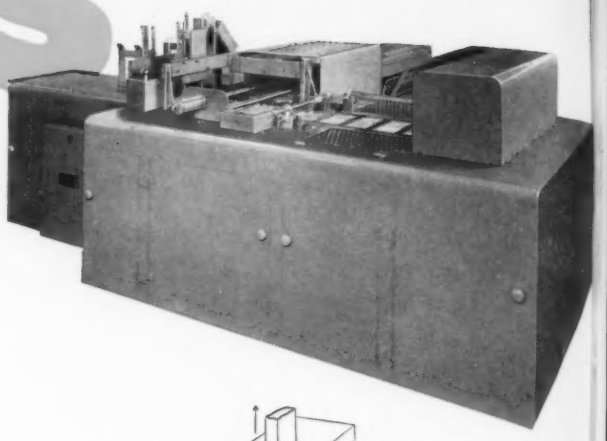

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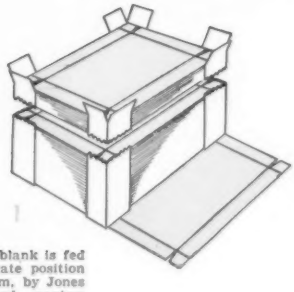
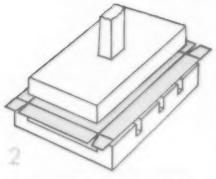


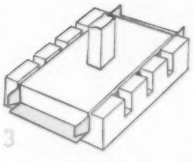
1

Flat tray blank is fed into accurate position on die-form, by Jones time-tested carton feeding method.



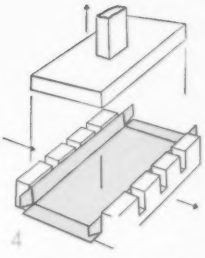
2

Each blank in its individual die-form moves intermittently but continuously through the machine.



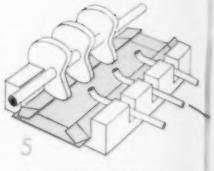
3

At the first station the overhead tamp presses the tray blank positively into the die-form.



4

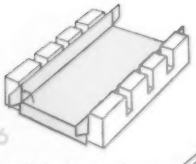
Tamp withdraws, leaving tray formed with true 90° side-walls.



5

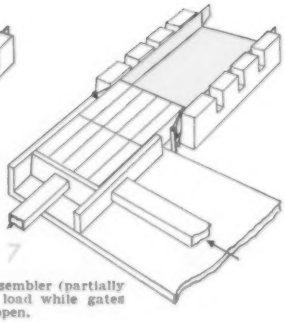
At another station side-walls are broken approximately 180° to assure minimum of side-wall bulge after tray leaves die-form.

. . . with 6 unique advantages



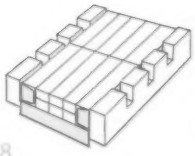
6

End-wall is turned down to loading position; side-walls resume 90° position.



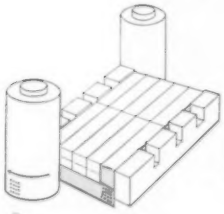
7

Multiple load assembler (partially shown) inserts load while gates hold side flaps open.



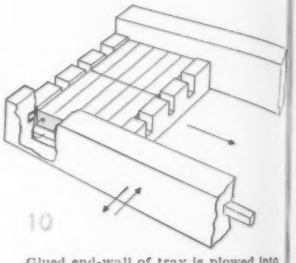
8

Side flaps closed by plow into position for glue application.



9

Jones trouble-free intaglio glue applicator is scraped clean of continuously circulating glue, retaining glue in hole pattern only. Tray flaps pressed against cylinder holes remove glue by suction and retain it in pattern of dots.



10

Glued end-wall of tray is plowed into contact with flaps prior to entering pressure plates. Pressure bars retract as die-form and tray move between stations, re-apply pressure at each successive station.

- Applies the standard Jones carton feeding method to tray handling.
- Pre-breaks carton side-walls 180° – reducing tendency to bulge. This reduces waste at wrapping machines by presenting more uniform package to wrap.
- Longer sealing time under pressure than with other tray forming machines.
- Lowers cost by elimination of double side-wall trays.
- First and only machine to combine automatic tray forming with automatic loading of uniform shaped loads.

  Thus it makes possible the adaptation of tray-type package to products now in cartons or overpack cartons.
- Speed – approximately 60 trays per minute.

For more information circle No. 231 on Reader Service Card

R. A. JONES & CO., INC.

P. O. BOX 485,
CINCINNATI, OHIO

Cartoners — Case Packers — Soap Presses

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